LANDING-FORCE MANUAL

UNITED STATES NAVY

1927

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LANDING-FORCE MANUAL

UNITED STATES NAVY

REVISED BY THE BUREAU OF NAVIGATION
NAVY DEPARTMENT

IN THE REVISION ASSISTANCE WAS FURNISHED BY
THE UNITED STATES NAVAL ACADEMY
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OFFICE OF THE SECRETARY,
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The Landing-Force Manual, United States Navy, 1927, is approved and herewith published for the information and guidance of the United States naval service.

These instructions supersede all others of a similar nature and will be strictly observed.

CURTIS D. WILBUR.

PREFACE

There are obvious advantages in harmonizing the methods of the Army and Navy in operations ashore. Naturally the Army is better informed on the methods of conducting operations ashore than the Navy; accordingly, the organization, drill, and combat principles of the Landing-Force Manual are based on those of the Army.

This revision of the Landing-Force Manual has brought it into agreement with the present United States Army Training Regulations, and in addition to facilitating cooperation between the services will insure that recruits entering either branch of the service will be drilled in the same manner, and that men honorably discharged from one branch of the service will be able to enter the other and profit by their previous experience.

The principal changes in this new revision of the Landing-Force Manual are as follows:

Rearrangement of subject matter.—The manual is now divided into three parts instead of two. Part I contains the drill regulations for preliminary training of officers and men; Part II contains the organization of the landing force, tactics ashore, hygiene and first aid, and all matter pertaining to intrenchments, mapping, and sketching; Part III contains the combat principles of the Infantry and machine-gun units adopted from the United States Army Training Regulations. Many new illustrations have been included.

Infantry.—All differences between the latest Army Training Regulations and the Landing-Force Manual have been brought into accord. The formations, drill, and combat principles of the headquarters units have been more completely covered. In a few instances amplifications of the Army Training Regulations have been included for the sake of clearness, but they do not involve a departure from the Army practice.

Machine guns.—The chapter on machine guns has been enlarged to include the United States Marine Corps Cole cart drill, extended order drill, gun emplacements, classes of fire, range cards, and the Browning (light) automatic rifle.

Medical tactics ashore, field hygiene, sanitation, and first aid.—This chapter, revised and enlarged under the direction of the Bureau of Medicine and Surgery, contains valuable new data and illustrations.

Part III—Combat principles.—Part III is a new addition containing the latest combat principles developed and adopted by the Army for various Infantry and machine-gun units. These principles, well illustrated by graphic examples, will assist officers in the conduct of a landing force.

In the application of these combat principles officers should be guided by those mental processes outlined in "The estimate of the situation."

Officers in formulating orders ashore should follow directions for field orders of the Army as given in this manual; these orders are based on the same principles as the order form used throughout the naval service with special adaptation to the Army's organization and chain of command.

In issuing orders a senior should not trespass on the province of his juniors; in executing orders, juniors should loyally endeavor to carry out the will of the commander as expressed in his order.

In unforeseen situations in the absence of orders or where previous orders manifestly no longer apply, juniors should endeavor to loyally anticipate the wishes of the higher command and do that which will most assist in the execution of the mission of the whole force.

The Navy Department acknowledges the courtesy of the War Department in authorizing the use of various United States Army Training Regulations in this manual.

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[1] These combat principles have been incorporated bodily from the Army Training Regulations and their TR, section and paragraph numbers have been retained.

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ABBREVIATIONS

bg. c	Brigade commander.
bg. adj	Brigade adjutant.
bg. com. off	Brigade communication officer.
bg. sf	Brigade staff.
bg. sur	Brigade surgeon.
bg. qm	Brigade quartermaster.
bg. c. p. o	Brigade chief petty officer (brigade sergeant major).
bg. sf. p. o	Brigade staff petty officer (brigade noncommissioned staff).
bg. s. o	Brigade supply officer.
rg. c	Regimental commander.
rg. adj	Regimental adjutant.
rg. exec	Regimental subcommander (executive officer).
rg. com. off	Regimental communication officer.
rg. sf	Regimental staff.
rg. s. o	Regimental supply officer.
rg. sur	Regimental surgeon.
rg. qm	Regimental quartermaster.
rg. c. p. o	Regimental chief petty officer (regimental sergeant major).
rg. sf. p. o	Regimental staff petty officer (regimental noncommissioned staff).
bn. c	Battalion commander.
bn. adj	Battalion adjutant.
bn. com. off	Battalion communication officer.
bn. sf	Battalion staff.
bn. s. o	Battalion supply officer.
bn. sur	Battalion surgeon.
bn. qm	Battalion quartermaster.
bn. c. p. o	Battalion chief petty officer (battalion sergeant major).
bn. sf. p. o	Battalion staff petty officer (battalion noncommissioned staff).
c. c	Company commander.
pt. c	Platoon commander (officer or warrant officer).
pt. l	Platoon leader (petty or noncommissioned officer in charge of a platoon).
c. p. o	Chief petty officer (first sergeant).
1. p. o	First petty officer (sergeant).
2. p. o	Second petty officer (corporal).
p. o	Petty officer (noncommissioned officer).

LANDING—FORCE MANUAL

Part I

Chapter 1

DRILL REGULATIONS

Section I.—DEFINITIONS

Accessory defenses: Wire entanglements, land mines, *chevaux-de-frise*, traps and other obstacles constituting the passive elements of defense.

Accompanying weapons: 1-pounders, light mortars, and artillery pieces attached to infantry battalions for an attack.

Alignment: A straight line upon which several elements are formed, or are to be formed; or the dressing of several elements upon a straight line.

Approach trench: A trench serving to connect fire trenches or an intrenched area with the rear.

Base: The element on which a movement is regulated.

Battle sight: The position of the rear sight when the leaf is laid down.

Center: The middle point or element of a command.

Column: A formation in which the elements are placed one behind another.

Containing action (or holding attack): An attack designed to hold the enemy to his positions, and prevent him from withdrawing a portion of his forces and employing them elsewhere.

Cover trench: A trench designed primarily solely for the purpose of affording cover from hostile fire.

Demonstration: An attack delivered on a front where a decision is not sought and made with the object of deceiving the enemy as to the point of decisive action.

Deploy: To extend the front. In general, to change from column to line, or from close order to extended order.

Depth: The space from head to rear of any formation or of a position, including the leading and rear elements. The depth of a man is assumed to be 12 inches.

Distance: Space between elements in the direction of depth. Distance is measured from the back of the man in front to the breast of the man in the rear. The distance between ranks is 40 inches in both line and column. *Facing distance is 14 inches. It is the distance between men who are faced to the flank, from a position in which they are in line at 4-inch intervals.*

Echelon: One of a series of elements formed one behind the other. Also a modification of a line formation in which the elements on one or both flanks are disposed to the rear of those on their right or left.

Echelonment: Act of retiring the flank elements of a line.

Element: A file, squad, platoon, company, or larger body, forming part of a still larger body.

File: Two men, the front-rank man and the corresponding man of the rear rank. The front-rank man is the **file leader.** A file which has no rear-rank man is a **blank file.** The term **file** applies also to a single man in a single-rank formation.

File closers: Such officers and petty officers of a company as are posted in rear of the line. For convenience, all men posted in the line of file closers.

Firing trench: A trench designed and constructed so as to facilitate the delivery of fire.

Flank: The right or left of a command in line or in column or the element on the right or left of the line. Also the side of a force or a position in the direction of depth.

Formation: Arrangement of the elements of a command. The placing of all fractions in their order in line, in column, or for battle.
Front: The direction of the enemy. When a combat situation does not exist or is not assumed, the front is the direction toward which the command is faced. Also the side of a force or position toward the enemy.
Frontage: The space occupied by an element measured from one flank to the opposite flank. The frontage of a man is assumed to be 22 inches.
Guide: An officer, petty officer, or private upon which the command or elements thereof regulates its march.
Head: The leading element of a column.
Interval: Space between elements of the same line. The interval between men in ranks is 4 inches and is measured from elbow to elbow. Between companies, squads, etc., it is measured from the left elbow of the left man or guide of the group on the right to the right elbow of the right man or guide of the group on the left.
Left: The left extremity or element of a body of troops.
Line: A formation in which the different elements are abreast of each other.
Loose pieces: Rifles and automatic rifles not used in making stacks.
Order, close: The formation in which the units, in double rank, are arranged in line or in column with normal intervals and distances.
Order, extended: The formation in which the units are separated by intervals greater than in close order.
Pace: Thirty inches; the length of the full step in quick time.
Petty officer, chief: A petty officer (normally a chief petty officer or petty officer first class), to perform the duties of the first sergeant of a company.
Petty officer, first: A petty officer (normally a petty officer first or second class) to perform the duties of a sergeant.
Petty officer, second: A petty officer (normally a petty officer second or third class), to perform the duties of a corporal.
Piece: The term piece as used in these regulations means the rifle and the automatic rifle.
Point of rest: The point at which a formation begins. Specifically, the point toward which units are aligned in successive movements.
Rank: A line of men placed side by side.
Right: The right extremity or element of a body of troops.
Step: The distance measured from heel to heel between the feet of a man walking. A step may be any number of inches. The half step, back step, right step, and left step are 15 inches. The right step and left step are 10 inches. The steps in quick and double time are 30 and 36 inches, respectively.
Support platoons: The platoons of the company used as a support to the assaulting platoons.
Wave: One of a series of lines of skirmishers or small columns into which an attacking unit is deployed.

Section II.—GENERAL RULES

1–1. **Purpose of drill.**—*a.* The Drill Regulations on close-order drill provide the principles for training in precise movements and for insuring the probability of success in battle.

b. Drills executed at *attention* are *disciplinary exercises* designed to give practice in soldierly movements and to inculcate that prompt obedience which is essential to discipline. To this end smartness and precision should be developed in the execution of every detail. Such drills should be frequent but short.

1–2. **Explanation of text in using right and left.**—Movements that may be executed toward either flank are explained as toward but one flank. To adapt a description of a movement executed toward one flank to its execution toward the opposite flank it is necessary only to substitute the word "left" for "right" as the case requires.

1–3. **General rules concerning movements.**—*a.* In movements executed toward the right flank when marching, the command of execution is given when the right foot strikes the ground; in movements toward the left flank, when the left foot strikes the ground.

b. Any movement may be executed either from a halt or when marching unless otherwise prescribed. If at a halt the command for movements involving marching, such as 1. **Column right (left)**, 2. **MARCH**, is not prefaced by the command **Forward**.

1–4. **Double time.**—*a.* Any movement not specially excepted may be executed in *double time.*

b. If a unit is at a halt, or marching in quick time, and it is desired that a movement be executed in double time, the command *double time* precedes the command of execution.

c. To hasten the execution of a movement begun in quick time, the command 1. **Double time**, 2. **MARCH**, is given. **Where applicable** the leading or base unit continues to march in quick time, or remains at a halt if already halted; the other units complete the execution of the movement in double time and then conform to the gait of the leading or base unit.

1–5. Correction of errors and commands.—*a.* To arrest a movement for the correction of errors in the execution when marching, the command: 1. **In place**, 2. **HALT**, is given. All halt and stand fast without changing the positions of the pieces. To resume the movement, the command: 1. **Resume**, 2. **MARCH**, is given.

b. To revoke a command, or to begin anew a movement improperly begun from a halt, the command: **AS YOU WERE**, is given, at which the movement ceases and the former position is resumed.

1–6. General rules for the guide.—*a.* Unless otherwise announced, the guide of a platoon or subdivision of a company in line is **right**; of a company in line or line of subdivisions, **center**; of a rank in column of squads, toward the side on which the guide of the column marches.

b. To march with the guide other than as prescribed above, or to change the guide, the command: **Guide (right, left, or center)**, is given.

c. In successive formations into line, the guide is toward the point of rest; in platoons or larger subdivisions, the guide is so announced.

d. The announcement of the guide, when made in connection with a movement, follows the command of execution for the movement.

1–7. Pivots.—*a.* The turn on fixed pivots by subdivisions is used in all formations from line into column and the reverse.

b. The turn on the moving pivot is used by subdivisions of a column in executing changes of direction.

1–8. Partial changes of direction.—*a.* Partial changes of direction may be executed by interpolating in the preparatory command the word **half**, as **Column half right (left)**, or **Right (left) half turn**, so as to change direction 45°.

b. Slight changes in direction are effected by the command: **Incline to the right (left)**. The guide or guiding element moves in the indicated direction, and the remainder of the command conforms.

1–9. Designations.—The designations **line of sections, line of platoons, or line of companies**, refer to the formations in which the sections, platoons, or companies, each in column of squads, are in line.

1–10. Distance and step.—*a.* Full distance in column of subdivisions is such that in forming line to the right or left, the subdivisions will have their proper intervals.

b. In column of subdivisions, the guide of the leading subdivision is charged with the step and direction; the guides in the rear preserve the trace, step, and distance.

1–11. Formation in double rank.—In close order, all details, detachments, and other bodies of troops are habitually formed in double rank.

1–12. Posts of officers, petty officers, guidons, and special units.—*a.* The posts of officers, petty officers, guidons, or special units, in the various formations of the platoon, company, battalion, or regiment, are shown in plates of the Drill Regulations for infantry drill.

b. When changes of formation involve changes of posts, the new post is taken by the most convenient and direct route, except where otherwise prescribed, as soon as practicable after the command of execution for the movement; officers and petty officers who have prescribed duties in connection with the movement ordered take their new posts when such duties are completed.

c. When acting as instructors, officers and petty officers go wherever their presence is necessary. As file closers, they rectify mistakes and insure steadiness and promptness in the ranks.

d. In subsequent movements after the initial formation, guidons and special units maintain their relative positions with respect to the flank or end of the command on which they were originally posted.

e. In all formations and movements, a petty officer commanding a platoon or company carries his rifle as the men do, if he is so armed. He takes the same post as prescribed for an officer in command. When giving commands, making reports, or drilling a unit, his rifle is at the right shoulder, if he be so armed.

1–13. Commands.—*a.* Commands only are employed in close-order drill **at attention**.

b. In these regulations a command is the direction of the commander expressed orally and in prescribed phraseology.

c. Where it is not mentioned in the text who gives the prescribed commands, they will be given by the commander of the unit.

d. There are two kinds of commands:

(1) The *preparatory command*, such as **forward**, which indicates the movement that is to be executed.

(2) The *command of execution*, such as **MARCH**, **HALT**, or **ARMS**, which causes the execution.

e. Preparatory commands are distinguished in these regulations by small heavy type and those of execution by *capitals*.

f. The preparatory command is given at such interval of time before the command of execution as to admit of proper understanding; the command of execution is given at the instant the movement is to commence.

g. When the preparatory command consists of more than one part, its elements are arranged as follows:

(1) For movements to be executed successively by the subdivisions or elements of an organization.

(*a*) Description of the movement.

(*b*) How executed, or on what element executed.

(2) For movements to be executed simultaneously by the subdivisions of an organization.

(*a*) The designation of the subdivision.

(*b*) The movement to be executed.

h. The tone of the command should be animated, distinct, and of a loudness proportioned to the number of men for whom it is intended.

i. Commanders of companies and larger units repeat such commands of their superiors as are to be executed by their units except where otherwise prescribed.

j. When giving commands to troops the commander faces them. When the platoon in close-order drill or in ceremonies is part of a larger unit, the leader turns his head toward the column to give commands but does not face about. Indifference in giving commands must be avoided, as this leads to laxity in execution. Commands must be given with spirit.

k. Officers and men fix their attention at the first word of command.

l. Commanders or leaders of subdivisions repeat commands whenever repetition is deemed necessary to insure prompt and correct execution.

1–14. Signals.—*a.* Officers, platoon and section leaders, and platoon 1. p. os. are equipped with whistles. The battalion commander and his staff use a whistle of distinctive tone; company commanders, a second distinctive whistle; platoon and section leaders, and platoon 1. p. os., a third distinctive whistle.

b. A signal includes both the preparatory command and the command of execution; the movement commences as soon as the signal is understood, unless otherwise prescribed.

c. Officers and men fix their attention at the first note of the bugle or whistle, or the first motion of the signal.

d. Commanders or leaders repeat signals whenever repetition is deemed necessary to insure prompt and correct execution.

e. Prescribed signals are limited to such as are essential as a substitute for the voice under conditions which render the voice inadequate.

Section III.—GENERAL OBJECTIVES OF MILITARY TRAINING

1–15. Success in battle is the ultimate object of all military training; success may be looked for only when the training is intelligent and thorough.

1–16. Commanding officers are accountable for the proper training of their respective organizations within the limits prescribed by regulations and orders.

The excellence of an organization is judged by its field efficiency. The field efficiency of an organization depends primarily upon its effectiveness as a whole. Thoroughness and uniformity in the training of the units of an organization are indispensable to the efficiency of the whole; it is by such means alone that the requisite teamwork may be developed.

1–17. Simple movements and elastic formations are essential to correct training for battle.

1–18. The Drill Regulations are furnished as a guide. They provide the principles for training and for increasing the probability of success in battle.

In the interpretation of the regulations, the spirit must be sought. Quibbling over the minutiæ of form is indicative of failure to grasp the spirit.

1–19. The following important distinctions must be observed:

(*a*) Drills executed at **attention** and the ceremonies are **disciplinary exercises** designed to teach precise and soldierly movement, and to inculcate that prompt and subconscious obedience which is essential to proper military control. To this end, smartness and precision should be exacted in the execution of every detail. Such drills should be frequent, but short.

(*b*) The purpose of **extended-order drill** is to teach the **mechanism** of deployment, of the firings, and, in general, of the employment of troops in combat. Such drills are in the nature of disciplinary exercises and should be frequent, thorough, and exact in order to habituate men to the firm control of their leaders. Extended-order drill is executed **at ease.** The platoon is the largest unit which executes extended-order drill.

(*c*) **Field exercises** are for instruction in the duties incident to campaign. Assumed situations are employed. Each exercise should conclude with a discussion, on the ground, of the exercise and principles involved.

(*d*) The **combat exercise, a form of field exercise** of the platoon, company, battalion, and larger units, consists of the **application of tactical principles** to assumed situations, employing in the execution the appropriate formations and movements of close and extended order.

Combat exercises must simulate, as far as possible, the battle conditions assumed. In order to familiarize both officers and men with such conditions, platoons, companies, and battalions will frequently be consolidated to provide war-strength organizations. Officers and p. os. not required to complete the full quota of the units participating are assigned as observers or umpires.

The firing line can rarely be controlled by the voice alone; thorough training to insure the proper use of prescribed signals is necessary.

The exercise should be followed by a brief drill at attention in order to restore smartness and control.

1–20. In field exercises the enemy is said to be **imaginary** when his position and force are merely assumed; **outlined** when his position and force are indicated by a few men; **represented** when a body of troops acts as such.

Chapter 2

INSTRUCTION WITHOUT ARMS AND WITH RIFLE AND AUTOMATIC RIFLE

A. Instruction Without Arms

Section I.—GENERAL RULES

2–1. Duties of instructor.—The instructor explains briefly each movement, first executing it himself. He requires the recruits to take the proper positions unassisted and touches them only for the purpose of correction, when they are unable to correct themselves. He avoids keeping the recruits too long at any movement. Each movement should, however, be understood before passing to another. The instructor exacts by degrees the desired precision and uniformity.

2–2. Grouping recruits.—*a.* To permit of more individual instruction, recruits are separated into groups, each group being as small as is consistent with the number of trained instructors available. Each group is then divided into two ranks, or is formed in single rank, depending upon the number of men in the group and the nature of the instruction.

b. As instruction progresses, the recruits are grouped according to proficiency, those showing a lack of aptitude and quickness being separated from the others and placed under the most experienced drill masters.

Section II.—ELEMENTARY INSTRUCTION

2–3. Position of attention.—*a.* Heels on the same line and as near each other as the conformation of the man permits.

b. Feet turned out equally and forming an angle of 45°.

c. Knees straight without stiffness. (Trousers will be rolled tightly against the leg and neatly tucked inside the leggins. Under no circumstances shall trousers be pulled out and allowed to bag down over the tops of the leggings.)

Fig. 1.—Position of attention

d. Hips level and drawn back slightly; body erect and resting equally on hips; chest lifted and arched; shoulders square and falling equally.

e. Arms hanging straight down without stiffness, so that the thumbs are along the seams of the trousers; back of the hands out; fingers held naturally.

f. Head erect and squarely to the front chin drawn in so that the axis of the head and neck is vertical; eyes straight to the front.

g. Weight of the body resting equally on the heels and the balls of the feet.

h. In assuming the position of attention, the heels are brought together smartly and audibly.

2–4. Rests.—*a.* Being at a halt, the commands are: **FALL OUT; REST; AT EASE; 1. Stand at, 2. EASE;** and **1. Parade, 2. REST.**

b. At the command **Fall out**, the men leave the ranks, but are required to remain in the immediate vicinity. The men resume their former places at attention at the command **Fall in.**

Fig. 2.—Stand at ease

c. At the command **Rest**, the right foot is kept in place, but silence and immobility are not required.

d. The command being **At ease**, keep the right foot in place. Silence but not immobility is required.

e. The command being **1. Stand at, 2. EASE.** At the command **Ease,** move the left foot smartly 12 inches to the left of the right foot; at the same time, clasp the hands behind the back, palms to the rear, thumb and fingers of the right hand clasping the left thumb, without constraint. Preserve silence and immobility, except that the head and eyes may be turned toward the instructor or unit commander. This command is given when it is desired to maintain a uniform appearance of the organization.

f. **1. Parade, 2. REST.** Carry the right foot 6 inches straight to the rear, left knee slightly bent, weight of the body equally distributed on both feet; at the same time, clasp the hands, without constraint, in front of the center of the body, fingers joined, left hand uppermost, left thumb clasped by the thumb and forefinger of the right hand; preserve silence and immobility.

g. Being at any of the rests, to resume the attention: **1. Squad, 2. ATTENTION.** Take the position of attention.

FIG. 3.—Parade rest. Front view

FIG. 4.—Parade rest. Side view

2–5. Eyes right or left.—**1. Eyes, 2. RIGHT (LEFT), 3. FRONT.** At the command **Right,** each man turns his head to the right, except the guide and, when in line, the man on the right in the rear rank and the man on the right in line of file closers. The eyes are fixed on the line of eyes of the men in, or supposed to be in, the same rank. At the command **Front,** turn the head and eyes to the front.

2–6. Facings.—*a. To the flank.*—(1) **1. Right, 2. FACE.** Raise slightly the left heel and right toe; face to the right, turning on the right heel, assisted by a slight pressure on the ball of the left foot. Hold the left leg straight without stiffness. (TWO) Place the left foot beside the right.

(2) Execute left face on the left heel in a corresponding manner.

b. Execute all facings in the cadence of quick time.

c. To the oblique.—**1. Right (left) half, 2. FACE.** Execute half face as in paragraph **2–6***a* facing but 45°.

d. To the rear.—**1. About, 2. FACE.** Carry the toe of the right foot about a half-foot length to the rear and slightly to the left of the left heel without changing the position of the left foot; weight of the body mainly on the heel of the left foot; right leg straight without stiffness. (TWO) Face to the rear, turning to the right on the left heel and on the ball of the right foot, place the right heel beside the left.

2–7. Salute with the hand.—*a.* **1. Hand, 2. SALUTE.** Raise the right hand smartly until the tip of the forefinger touches the lower part of the headdress or forehead above and slightly to the right of the right eye, thumb and fingers extended and joined, palm to the left, upper arm horizontal, forearm inclined at

about 45°, hand and wrist straight; at the same time turn the head and eyes toward the person saluted. (Do not turn the head more than 45° from the front.) (TWO) Drop the arm to its normal position by the side in one motion, at the same time turning the head and eyes to the front.

b. Execute the first position of the hand salute when 6 paces from the person saluted, or at the nearest point of approach, if more than 6 paces. Hold the first position until the person saluted has passed, or the salute is returned. Then execute the second movement of the hand salute.

c. In passing in review at ceremonies execute the hand salute similarly, except that the first position of the salute is held until 6 paces beyond the person saluted. Look the person saluted squarely in the eyes at the first motion of the salute and thereafter hold the head and eyes in the position of **eyes right (left)** until the salute is completed.

FIG 5.—Hand salute.
Front view

FIG. 6.—Hand salute.
Side view

Section III.—STEPS AND MARCHINGS

2–8. General rules.—*a.* All steps and marchings executed from the halt, except right step, begin with the left foot.

b. (1) The length of the full step in quick time is 30 inches, measured from heel to heel, and the cadence is at the rate of 128 steps per minute.

(2) The length of the full step in double time is 36 inches; the cadence at the rate of 180 steps per minute.

c. The instructor, when necessary, indicates the cadence of the step by calling *one, two, three, four,* the instant the left and right foot, respectively, should be planted.

2–9. Quick time.—*a.* Being at a halt, to march forward in quick time: 1. **Forward,** 2. **MARCH.**

b. At the command **Forward,** shift the weight of the body to the right leg, without perceptible movement.

c. At the command **March,** move the left foot smartly straight forward 30 inches from the right, sole near the ground, and plant it without shock; next, in like manner, advance the right foot and plant it as above; continue the march. Swing the arms about 6 inches to the front, and about 3 inches to the rear of the body.

2–10. To double time.—*a.* Being at a halt, or in march in quick time, to march in double time: 1. **Double time,** 2. **MARCH.**

b. If at a halt, at the command **Double time,** shift the weight of the body to the right leg without perceptible movement. At the command **March,** raise the forearms, fingers closed, knuckles out, to a horizontal position along the waist

line; take up an easy run with the step and cadence of double time, allowing a natural swinging motion to the arms.

c. If marching in quick time, at the command **March**, given as either foot strikes the ground, take one step in quick time and then step off in double time.

d. To resume the quick time: 1. **Quick time**, 2. **MARCH.** At the command **March**, given as either foot strikes the ground, advance and plant the other foot in double time; resume the quick time, dropping the hands by the sides.

2–11. To halt.—*a.* To arrest the march in quick time: 1. **Squad**, 2. **HALT.** When marching forward or backward or marking time, at the command **Halt**, given as either foot strikes the ground, plant the other foot as in the movement being executed; raise and place the first foot by the side of the other.

b. To arrest the march in double time: 1. **Squad**, 2. **HALT.** At the command **Halt**, given as either foot strikes the ground, plant the other foot as in double time, then halt in two counts as in quick time.

c. To arrest the march from side steps: 1. **Squad**, 2. **HALT.** At the command **Halt** given as the heels are together, plant the foot next in cadence as in the movement being executed, completing the halt when the heels are next brought together.

2–12. To mark time.—*a.* Being in march: 1. **Mark time**, 2. **MARCH.**

b. At the command **March**, given as either foot strikes the ground, advance and plant the other foot; bring up the foot in rear, placing it so that both heels are on line and continue the cadence by alternately raising and planting each foot. Each foot is raised 2 inches from the ground.

c. Being at a halt, at the command **March**, raise and plant first the left foot, then the right as prescribed above.

2–13. Half step.—*a.* 1. **Half step**, 2. **MARCH.** Take steps of 15 inches in quick time and 18 inches in double time in the same manner as in the full step.

b. **Forward, half step, halt,** and **mark time** may be executed one from the other in quick or double time.

c. To resume the full step from half step or mark time: 1. **Forward**, 2. **MARCH.**

2–14. Side step.—*a.* Being at a halt or mark time: 1. **Right (left) step**, 2. **MARCH.**

b. Carry the right foot 10 inches to the right; place the left foot beside the right, left knee straight. Continue in the cadence of quick time.

c. The side step is used for short distances only and is not executed in double time.

2–15. Back step.—*a.* Being at a halt or mark time: 1. **Backward**, 2. **MARCH.**

b. Take steps of 15 inches straight to the rear. The back step is used for short distances only and is not executed in double time.

2–16. To face in marching.—*a. To face in marching and advance from a halt.*—At the command of execution, turn in the designated direction on the ball of the right foot and at the same time step off in the new direction with the left foot with a half step, full step, or in double time, as the case may be.

b. To face in marching and mark time from a halt.—Execute the movement similarly, the left foot being placed beside the right as in mark time.

c. To face to the right in marching and advance, being in march.—At the command of execution, given as the right foot strikes the ground, advance and plant the left foot. (TWO) Turn to the right on the ball of the left foot and at the same time step off in the new direction with the right foot at a half step, full step, or in double time, as the case may be.

d. To face to the left in marching and advance, being in march.—Execute the movement similarly, the command of execution being given as the left foot strikes the ground.

e. To face to the right (left) in marching and mark time, being in march.—At the command of execution, given as the right foot strikes the ground, advance and plant the left foot. (TWO) Turn to the right on the ball of the left foot; at the same time raise the right foot and place it beside the left foot as in mark time.

f. In movements, such as the turn on the fixed pivot at a halt, wherein a definite number of steps is required, the execution of the prescribed face in marching by certain members of the squad is not always possible. For such cases, facing on the ball of either foot is authorized.

2–17. To march by the flank.—*a.* Being in march: 1. **By the right (left) flank**, 2. **MARCH.**

b. At the command **March**, given as the right foot strikes the ground, advance and plant the left foot, then face to the right in marching and step off in the new direction with the right foot.

2–18. To march to the rear.—*a.* Being in march: 1. **To the rear**, 2. **MARCH.**

b. At the command **March**, given as the right foot strikes the ground, advance and plant the left foot; turn to the right about on the balls of both feet and immediately step off with the left foot. If marching in double time, turn to the right about, taking four steps in place and keeping the cadence, and then step ofl with the left foot.

2–19. To change step.—*a.* Being in march in quick time: 1. **Change step**, 2. **MARCH.**

b. At the command **March**, given as the right foot strikes the ground, advance and plant the left foot; plant the toe of the right foot near the heel of the left and step off with the left foot.

c. Execute the change on the right foot similarly, the command **March**, being given as the left foot strikes the ground.

d. Being in march in double time: At the command **March**, given as either foot strikes the ground, take one hop on the next foot and continue the march.

B. Instruction with Rifle and Automatic Rifle

Section I.—GENERAL RULES

2–20. Instruction of recruit.—As soon as practicable the recruit is taught the use, care, and nomenclature of the rifle. When fair progress has been made in the instruction without arms, he is taught the manual of arms. Instruction without arms and with arms should alternate.

2–21. Rules governing carrying of the rifle.—*a.* The rifle is not carried with cartridges in either the chamber or the magazine except when specifically ordered. When so loaded or when supposed to be loaded, it is habitually carried locked; that is, with the safety lock turned to the "safe." At all other times it is carried unlocked, with the trigger pulled.

b. Whenever troops are formed under arms, pieces are immediately inspected at the command: 1. **Inspection**, 2. **ARMS.** A similar inspection is made before dismissal. If cartridges are found in the chamber or magazine, they are removed and placed in the belt.

c. The cut-off is kept turned "off" except when cartridges are actually used. (Applicable to troops armed with U. S. Rifle, Model 1903.)

d. The bayonet is fixed at any time when so ordered.

e. **Fall in** is executed with the rifle at the order arms.

f. (1) If at the order, unless otherwise prescribed, the rifle is brought to the right shoulder at the command **March** (in quick time), the 3 motions corresponding with the first 3 steps. If **Double time** is given prior to **March**, the unit is brought to the **Right (left) shoulder** or **Port arms**, before the command double time.

(2) Movements may be executed at the trail by prefacing the preparatory command with the words **at trail**; as 1. **At trail, forward**, 2. **MARCH.** The trail is taken at the command **March.**

(3) When the facings, alignments, open and close ranks, side step and back step, taking interval and assembly are executed from the order, the rifle is brought to the trail while in motion and the order resumed on halting.

g. The rifle is brought to the order on halting except in executing: 1. **In place**, 2. **HALT.** The execution of the order begins when the halt is completed.

h. In double time, when armed with the rifle, a disengaged hand is held as when without arms.

2–22. Rules governing carrying of the automatic rifle.—*a.* At the command **Fall in**, automatic rifles are slung over the right shoulder, butt down, barrel to the rear.

b. For ceremonies and drill, the automatic rifle is carried slung over the right shoulder, butt down, barrel to the rear.

c. For marches and field exercises, the automatic rifle may be carried slung over either shoulder.

d. When troops are brought to attention, the automatic rifle is slung as prescribed for drills and ceremonies. It is carried slung until the command **Rest** is given, unless otherwise ordered.

e. When troops are standing at ease, the automatic rifle is kept slung unless otherwise ordered. Automatic riflemen assume the position of **at ease** or **stand at ease** as without arms. If the automatic rifle is ordered unslung, the position of **at ease** or **stand at ease** is taken as prescribed for troops armed with the rifle.

f. When troops are standing at rest the automatic rifle is unslung.

g. The automatic rifleman does not execute the manual except—

(1) 1. **Parade**, 2. **REST**. Execute the movement as without arms.

(2) 1. **Inspection**, 2. **ARMS**. At the command **Arms** grasp the magazine with the left hand, at the same time pressing the magazine release with the right hand. Withdraw the magazine with the left hand and place in belt. Pull back the operating handle with the left hand.

(3) Being at inspection arms: 1. **Order (port, right shoulder)**, 2. **ARMS**. At the command **Order**, pull the trigger, replace the magazine, and resume the position of attention, the automatic rifle being kept slung.

FIG. 7.—Position of automatic rifle slung over right shoulder. Front view

h. When arms are stacked the automatic rifle is placed on the stack as prescribed for a loose piece.

i. The automatic rifle belt is worn whenever the automatic rifle is carried.

j. The salute.—When the automatic rifle is unslung the salute is executed as with the rifle. When the automatic rifle is carried slung, the hand salute is executed.

2–23. Rules governing the execution of manual of arms.—*a.* In all positions of the left hand at the balance, the thumb clasps the rifle; the sling is included in the grasp of the hand. In describing the manual of arms, the term "at the balance" in this text refers to the center of the rear-sight leaf of the model 1903 rifle, and to the center of the groove on the hand guard of the model 1917 rifle.

b. In all positions of the rifle, "*diagonally across the body,*" the position of the rifle, left arm and left hand is the same as in port arms.

FIG. 8.—Position of automatic rifle slung over right shoulder. Side view

c. In resuming the order from any position in the manual, the motion next to the last concludes with all fingers of the right hand grasping the rifle just above the lower band, the butt of the rifle about 3 inches from the ground, barrel to the rear, the left hand above and near the right, steadying the rifle, thumb and fingers extended and joined, forearm and wrist straight and inclining downward. To complete the order, lower the rifle gently to the ground with the right hand, cut away the left smartly to the side, and take the position of order arms. Allowing the rifle to drop through the right hand to the ground, or similar abuse of the rifle to produce effect in executing the manual, is prohibited.

d. The cadence of the motions is that of quick time. The recruits are first required to give their whole attention to the details of the motions, the cadence being gradually acquired as they become accustomed to handling their rifles. The instructor may require them to count aloud in cadence with the motions.

e. (1) The manual may be executed while marching, except **Present arms, Order arms, Parade rest, Trail arms, Stand at ease, Inspection arms, Fix bayonets** and **Unfix bayonets.**

(2) The manual is taught at a halt and the movements are, for the purpose of instruction, divided into motions and executed in detail. In this case, the command of execution determines the prompt execution of the first motion, and the commands **Two, three, four**, that of the other motions.

(3) To execute the movement in detail, the instructor first cautions: **By the numbers.** All movements divided into motions are then executed as above explained until he cautions: **Without the numbers**, or commands movements other than those in the manual of arms.

f. (1) Whenever circumstances require, the regular positions of the manual of arms and the firings may be ordered without regard to the previous position of the rifle.

(2) Under exceptional conditions of weather or fatigue, the rifle may be carried in any manner directed.

g. The front-sight cover will be removed only when cleaning the rifle or when engaged in musketry practice.

2–24. Rules governing the conduct of men armed with the pistol.—*a.* Officers and enlisted men, armed with the pistol only, remain at the position of the soldier without arms during the execution of the manual, except when their units are brought to the present as a part of a cermony, such as—

(1) The ceremonies described in chapter 5.
(2) The presentation of an organization to its commander.
(3) At retreat.
(4) At guard mounting.

b. Under the conditions set forth above, officers and enlisted men, armed with the pistol only, execute the first motion of the hand salute at the command Arms, and the second motion of the hand salute at the command of execution of the next command.

c. When organizations and detachments are not formed as part of a larger unit, and are composed entirely of men armed with the pistol, the commands for rendering the salute prescribed above are: 1. **By the numbers**, 2. **Hand**, 3. **SALUTE**, 4. **TWO**.

Section II.—MANUAL OF ARMS

2–25. Position of order arms.—The butt rests on the ground, barrel to the rear, toe of the butt on line with the toe of, and touching the right shoe, right hand holding the rifle between the thumb and fingers, left hand as in position of the soldier without arms.

FIG. 9.—Order arms. Front view

FIG. 10.—Order arms. Side view

FIG. 11.—Trail arms

2–26. Being at order arms: 1. Trail, 2. ARMS.—Raise the rifle and incline the muzzle forward so that the barrel makes an angle of about 30° with the vertical, the right arm bent slightly.

2–27. Being at trail arms: 1. Order, 2. ARMS.—Lower the rifle with the right hand and resume the order.

2–28. Being at order arms: 1. Port, 2. ARMS.—With the right hand, raise and throw the rifle diagonnally across the body, regrasp it smartly with both hands at the same time; the right, at the small of the stock, palm down;

the left, at the balance, palm toward the body, wrist straight; barrel up, sloping to the left and crossing opposite the junction of the neck with the left shoulder; the right forearm horizontal; left forearm resting against the body; the rifle in a vertical plane parallel to the front.

FIG. 12.—Port arms. Front view

FIG. 13.—Port arms. Side view

FIG. 14.—Order arms, next to last position

2–29. Being at present or port arms: 1. Order, 2. ARMS.—Drop the rifle to the next to last position of order arms, at the same time regrasp it smartly with the right hand just above the lower band and place the left hand above and near the right. (TWO) Complete the order, cutting away the left hand smartly to the side.

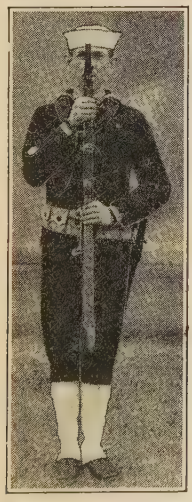


FIG. 15.—Present arms. Position ARMS

2–30. Being at order arms: 1. Inspection, 2. ARMS.—At the command **Arms**, take the position of port arms. (TWO) Seize the bolt handle with the thumb and forefinger of the right hand, turn the handle up, draw the bolt back, lower the head and eyes sufficiently to glance into the magazine. Having found the magazine empty, or having emptied it, raise the head and eyes to the front.

2–30a. Being at inspection arms: 1. Order (right shoulder, port), 2. ARMS.—At the preparatory command, push the bolt forward, turn the handle down, pull the trigger, and resume **port arms.** At the command **Arms**, complete the movement ordered.

FIG. 16.—Present arms. Position TWO

2–31. Being at order arms: 1. Present, 2. ARMS.—With the right hand, carry the rifle in front of the center of the body, barrel to the rear and vertical, grasp it with the left hand at the balance, forearm horizontal and resting against the body. Include the rear sight leaf in the grasp of the left thumb. (Applicable to men armed with the U. S. Rifle, Model 1903.) (TWO) Grasp the small of the stock with the right hand.

2–32. Being at order arms: 1. Right shoulder, 2. ARMS.—With the right hand, raise and throw the rifle diagonally across the body; grasp it with the right hand at the butt, the heel between the first two fingers, thumb and fingers

closed on the stock. (TWO) Without changing the grasp of the right hand, place the rifle on the right shoulder, barrel up and inclined at an angle of about 45°

FIG. 17.—Right shoulder arms. Position ARMS

FIG. 18.—Right shoulder arms. Position TWO

FIG. 19.—Right shoulder arms. Position THREE, front view

from the horizontal, trigger guard in the hollow of the shoulder, right elbow against the side, forearm horizontal, the rifle in a vertical plane perpendicular to the front; carry the left hand, thumb and fingers extended and joined, to the small of the stock, first joint of the forefinger touching the cocking piece, wrist straight and elbow down. (THREE) Cut away the left hand smartly to the side.

FIG. 20.—Right shoulder arms. Position THREE, side view

2–33. Being at right shoulder arms: 1. Order, 2. ARMS.—Press down the butt quickly and throw the rifle diagonally across the body, the right hand retaining the grasp of the butt. (TWO), (THREE) Execute order arms as prescribed from port arms.

2–34. Being at present arms: 1. Port, 2. ARMS.—Carry the rifle diagonally across the body and take the position of port arms.

2–35. Being at port arms: 1. Present, 2. ARMS.—Carry the rifle to a vertical position in front of the center of the body and take the position of present arms.

2–36. Being at right shoulder arms: 1. Port, 2. ARMS.—Press the butt down quickly and throw the rifle diagonally across the body, at the same time turning it to the left so as to bring the barrel up, the right hand retaining its grasp of the butt. (TWO) Change the right hand to the small of the stock.

2–37. Being at right shoulder arms: 1. Present, 2. ARMS.—Execute port arms. (THREE) Execute present arms.

2–38. Being at port arms: 1. Right shoulder. 2. ARMS.—Change the right hand to the butt, (TWO), (THREE) Execute the last two movements as in right shoulder arms from order arms.

2–39. Being at present arms: 1. Right shoulder, 2. ARMS.—Execute port arms. (TWO), (THREE), (FOUR) Execute right shoulder arms as from port arms.

2-40. Being at port arms: 1. Left shoulder, 2. ARMS.—Carry the rifle with the right hand and place it on the left shoulder, barrel up, trigger guard in the hollow of the shoulder; at the same time grasp the butt with the left-hand heel between the first two fingers, thumb and fingers closed on the stock; left forearm horizontal, left elbow against the side, the rifle in a vertical plane perpendicular to the front. (TWO) Cut away the right hand smartly to the side.

2-41. Being at left shoulder arms: 1. Port, 2. ARMS.—*a.* Grasp the rifle with the right hand at the small of the stock. (TWO) Carry the rifle to the right with the right hand, regrasp it with the left, and take the position of port arms.

b. Left shoulder arms may be ordered directly from the order, right shoulder or present, or the reverse. At the command **Arms**, execute port arms and continue in cadence to the position ordered.

2-42. Being at order arms: 1. Parade, 2. REST.—Carry the right foot 6 inches straight to the rear, left knee bent slightly; carry the muzzle in front of the center of the body, barrel to the left, turning the rifle on the heel of the butt, grasp the rifle with the left hand just below the stacking swivel, and with the right hand below and against the left; the weight of the body resting equally on the heels and balls of both feet.

FIG. 21.—Parade rest. Front view

FIG. 22.—Parade rest. Side view

FIG. 23.—Rifle salute at right shoulder arms

2-43. Being at parade rest: 1. Squad, 2. ATTENTION.—Turn the rifle to the left on the heel of the butt, and bring it to a vertical position, at the same time placing the right foot beside the left. (TWO) Cut away the left hand smartly to the side and resume the order.

2-44. Being at right shoulder arms: 1. Rifle, 2. SALUTE.—Carry the left hand smartly to the small of the stock, forearm horizontal, palm of the hand down, thumb and fingers extended and joined, first joint of the forefinger touching end of cocking piece; look toward the person saluted. (TWO) Cut away the left hand smartly to the side; turn the head and eyes to the front.

2-45. Being at order or trail arms: 1. Rifle, 2. SALUTE.—Carry the left hand smartly to the right side, palm of the hand down, thumb and fingers extended and joined, forearm and wrist straight, first joint of forefinger against the rifle just above the stacking swivel; look toward the person saluted. (TWO) Cut away the left hand smartly to the side; turn the head and eyes to the front.

2-46. Being at order arms: 1. Fix, 2. BAYONETS.—*a.* If the bayonet scabbard is carried on the belt: Execute parade rest; grasp the bayonet with the right hand back of the hand toward the body; pressing the spring with the forefinger, draw the bayonet from the scabbard and fix it on the barrel, glancing at the muzzle; resume the order.

b. If the bayonet is carried on the haversack: Draw and fix the bayonet in the most convenient manner.

2–46*a.* **CHARGE BAYONET.** Whether executed at halt or in motion, the bayonet is held toward the opponent as in the position of guard in Art. 10–10.

2–47. **Being at order arms: 1. Unfix, 2. BAYONETS.**—*a.* If the bayonet scabbard is carried on the belt: Execute parade rest; grasp the handle of the bayonet with the right hand, pressing the spring, raise the bayonet until the handle is about 12 inches above the muzzle of the rifle; drop the point to the left back of the hand toward the body, and glancing at the scabbard, return the bayonet, the blade passing between the left arm and the body; regrasp the rifle with the right hand and resume the order.

b. If the bayonet scabbard is carried on the haversack: Take the bayonet from the rifle as described above and return it to the scabbard in the most convenient manner.

2–48. **Being at order arms: 1. Stand at, 2. EASE.**—*a.* At the command, **Ease,** carry the left foot about 12 inches to the left, keeping the legs straight, so that the weight of the body rests equally on both feet. At the same time incline the muzzle of the rifle to the front, the right arm extended, right hand

FIG. 24.—Rifle salute at order arms

FIG. 25.—Stand at ease. Front view

FIG. 26.—Stand at ease Side view

grasping the rifle just below the upper band. Hold the left hand behind the body resting in the small of the back, palm to the rear.

b. This command will be used when it is desired to maintain a uniform appearance of the unit.

Section. III.—LOADINGS AND FIRINGS

2–49. **General rules.**—*a.* The commands for loading and firing are the same whether standing, kneeling, sitting, or lying down.

b. When kneeling, sitting, or lying down in double rank the rear rank does not load, aim, or fire.

c. The instruction in firing is preceded by a command for loading.

d. Loadings are executed in line and skirmish line only.

e. Rifles having been ordered loaded, are kept loaded without command until the command **Unload** or **Inspection arms,** fresh clips being inserted when the magazine is exhausted.

2–50. **To load.**—*a.* Being in line or skirmish line at a halt: 1. **With dummy (blank or ball) cartridges,** 2. **LOAD.** At the command **Load** each front rank rifleman or skirmisher faces half right and carries the right foot about 12 inches to the right to such position as will insure the greatest firmness and steadiness of

the body, raises or lowers the rifle and drops it into the left hand at the balance, left thumb extended along the stock, muzzle at the height of the breast, and if armed with the model 1903 rifle, turns the cut-off up. With the right hand he turns up the bolt and draws it back; takes a loaded clip and inserts the end in the clip slots, places his thumb on the powder space of the top cartridge, the fingers extending around the rifle and tips resting on the magazine floor plate; forces the cartridges into the magazine by pressing down with the thumb; removes the clip; thrusts the bolt home, turning down the handle; turns the safety lock to the "safe" and carries the hand to the small of the stock. When in double rank each rear rank rifleman moves to the right front, takes a similar position opposite the interval to the right of his front rank man, muzzle of his rifle extending beyond the front rank, and loads. Automatic riflemen do not execute the loadings or firings in close order.

b. For instruction in loading: 1. **Simulate**, 2. **LOAD.** Execute as above described, except that the cut-off (model 1903 rifle) remains "off" and the handling of the cartridges is simulated. The recruits are first taught to simulate loading and firing. After a few lessons, dummy cartridges may be used. Later blank cartridges may be used.

c. The model 1903 rifle may be used as a single loader by turning the magazine "off." The magazine may be filled in whole or in part while "off" or "on" by pressing cartridges singly down and back until they are in the proper place. The use of the rifle as a single loader is, however, to be regarded as exceptional. The model 1917 rifle can not be used as a single loader.

2–51. To unload.—Being in line or skirmish line: **UNLOAD.** Take the position of **load**, turn the safety lock (model 1903 rifle) up (if armed with the model 1917 rifle turn the safety lock to the front), and move the bolt alternately backward and forward until all the cartridges are ejected. After the last cartridge is ejected, the chamber is closed by first thrusting the bolt forward slightly to free it from the stud holding it in place when the chamber is opened, pressing the follower down and back to engage it under the bolt, and then thrusting the bolt home. The trigger then is pulled, the cartridges are picked up, cleaned, and returned to the belt, and the rifle is brought to the order.

2–52. To fire by volley.—*a.* Being in any firing formation and rifles loaded: 1. **Ready**, 2. **AIM**, 3. **Squad**, 4. **FIRE.** (For ceremonial purposes.)

At the command **Ready** take the position of load if not already there and turn the safety lock to the "ready." At the command **Aim** raise the rifle with both hands, butt placed and held firmly against the shoulder, left hand well under the rifle, left hand grasping the rifle at or in front of the balance, rifle resting in the palm of the left hand, right elbow at the height of the shoulder, right cheek held firmly against the stock as far forward as it can be placed without straining. The rifle is raised 30° from the horizontal or, if ordered, at the horizontal. The left eye is closed, right eye looking through the notch of the rear sight. At the command **Fire** the trigger is squeezed rapidly; the rifle is then lowered to the position of load and loaded.

When in double rank each rear rank man aims through the interval to the right of his file leader and leans forward slightly to advance the muzzle of his rifle beyond his front rank man.

b. To continue the firing: 1. **Aim**, 2. **Squad**, 3. **FIRE.** Each command is executed as previously explained. **Load** (from the magazine) is executed by drawing back and thrusting home the bolt with the right hand, leaving the safety lock turned up to the "ready."

2–53. To suspend firing.—*a.* The instructor blows a long blast of the whistle and repeats it, if necessary, or commands: **SUSPEND FIRING.**

Firing stops; rifles are held loaded and locked, in a position of readiness for instant resumption of firing, rear sights unchanged. The men continue to observe the target or aiming point, or place at which the target disappeared, or at which it is expected to reappear. Suspend firing is used for short pauses or to steady the men.

b. This whistle signal may be used as a preliminary to *cease firing.*

2–54. To cease firing.—*a.* **CEASE FIRING.** Firing stops; rifles not already there are brought to the position of **load**; those not loaded are then loaded; sights are laid and rifles are locked and brought to the order. Cease firing is used for long pauses, to prepare for changes of position.

b. Commands for suspending or ceasing fire may be given at any time after the preparatory command for firing whether the firing has actually commenced or not.

Chapter 3

DRILL, THE RIFLE SQUAD, PLATOON, AND COMPANY

Section I.—THE RIFLE SQUAD

3–1. Definition and purpose.—A squad is a group of men formed for the purpose of instruction, discipline, control, and order.

The movements of squad drill are so designated as to use the squad as a fixed unit for the purpose of facilitating and controlling the movements of the company.

The term *squad*, as hereinafter used, means the rifle squad unless otherwise stated.

3–2. Strength.—The squad proper consists of a petty officer, one auto-rifleman, and six riflemen.

If the number of men grouped is more than 5 and less than 12 they are formed as a squad of 4 files, any excess above 8 being posted in the line of file closers.

If the number of men grouped is greater than 11, two or more squads are formed and the group is termed a section or a platoon.

For the instruction of recruits these rules may be modified.

3–3. Organization.—*a.* The petty officer is the squad leader and when absent is replaced by the second in command. If the second in command is also absent the senior rifleman acts as leader.

b. The petty officer, when in ranks, is posted as the left man in the front rank of the squad. When the squad leader leaves the ranks to drill his squad, his rear-rank man steps into the front rank and No. 3, rear rank, moves over and covers No. 4, front rank. When the squad leader returns to ranks the original formation is resumed.

c. When there are only seven men in the squad, No. 3 is a blank file; when only six, Nos. 2 and 3 are blank files.

d. When the squad is formed the front line of files is the front rank and the rear line of files is the rear rank.

When a squad is faced or marches to the rear, the original rear rank becomes the front and remains such until the formation is again changed, but blank spaces in the original rear rank are not filled.

e. When any blank space occurs in the front rank it is immediately filled by the corresponding rear-rank man, except as noted in paragraph 3–3*d*. In case there is no corresponding rear-rank man the blank space is filled by some other rear-rank man.

f. One rifleman is a substitute automatic rifleman. He is the first man to take over the automatic rifle, in the event the automatic rifleman becomes a casualty.

g. Two riflemen are scouts. One is the scout for the squad and the other is assistant scout.

3–4. To form the squad.—*a.* To form the squad before the permanent organization has been made, the instructor places himself 3 paces in front of where the center of the squad is to be and commands: **FALL IN.**

The men assemble at attention, pieces at the order and are arranged by the squad leader in double rank in order of height from right to left. Each man brings up his left arm as in **Right dress** and drops it as soon as the man on his left has his interval. The rear rank forms with distance of 40 inches. The men on the left of the squad (left file) do not bring up their arms.

The instructor then commands: 1. **Count**, 2. **OFF.** At this command, all except the right file execute **Eyes right**, and, beginning on the right, the men in each rank count *one, two, three, four;* each man turns his head and eyes to the front as he counts.

Pieces are then inspected.

b. As soon as its permanent organization has been fixed, the squad forms, without regard to height, in the desired formation as follows: No. 1 front rank,

rifleman and scout; No. 1 rear rank, rifleman and assistant scout; No. 2 rear rank, rifleman; No. 4 rear rank, rifleman and second in command; No. 2 front rank, rifleman with grenade discharger; No. 3 rear rank, automatic rifleman; No. 3 front rank, rifleman and substitute automatic rifleman; No. 4 front rank, petty officer.

3–5. Previous instruction applicable.—The squad executes the **halt, rests, facings, steps,** and **marchings,** and the **manual of arms** as prescribed in chapter 2.

3–6. Alignments.—*a.* To align the squad, the base file or files having been established, the command is: 1. **Right** (**left**), 2. **DRESS**, 3. **FRONT**.

(1) At the command **Dress**, each man who has to furnish 4 inches interval to the man on his left, places the left hand with the fingers extended downward and joined, thumb along the forefinger, upon the left hip, heel of the hand resting against the hip bone near the belt. The left elbow is in the plane of the body. At the same time each man except the base file executes **Eyes right** and places himself so that his right arm rests lightly against the left elbow of the man on his right, and so that his eyes and shoulders are in line with those on his right. The rear-rank men cover in file. Each man halts upon his arrival at his proper position.

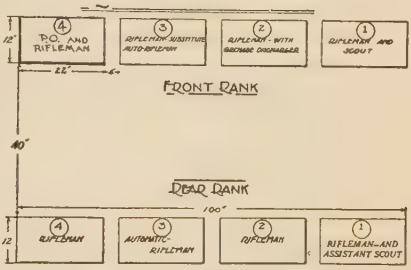


FIG. 27.—Squad organization

(2) The instructor verifies the alignment of both ranks from a position 2 paces from that flank toward which the squad is dressing, which is the point of rest, and orders up or back such men as may be in rear or in advance of the line; only the men designated move.

(3) At the command **Front**, given when the ranks are aligned, each man turns his head and eyes smartly to the front and drops his left hand quickly by his side.

b. When marching, the men preserve their intervals from the side of the guide, yield to pressure from that side, and resist pressure from the opposite direction.

They recover intervals, if lost, by gradually opening out or closing in; they recover alignment by slightly lengthening or shortening steps. The rear-rank men cover their file leaders at 40 inches.

In double rank the front-rank man on the right, or designated flank, is the guide. When marching faced to the flank the leading man of the front rank is the guide.

3–7. To open and close ranks.—*a.* The squad being in line at a halt, to open ranks, the command is: 1. **Open ranks**, 2. **MARCH**, 3. **FRONT**. At the command **March** the front-rank men execute right dress; the rear-rank men and file closers march backward four steps, halt, and then execute right dress.

The instructor verifies the alignment and commands: **FRONT**, as described in paragraph **3–6**.

b. The squad being at open ranks, to close ranks, the command is: 1. **Close ranks**, 2. **MARCH**. At the command **March** the rear-rank men close to 40 inches, each man covering his file leader; the file closers close to 2 paces from the rear rank.

3–8. To take intervals.—*a.* When the unit is in line at a halt, the command to take intervals is: 1. **Take interval**, 2. **To the right** (**left**), 3. **MARCH**, 4. **Squad**, 5. **HALT**. At the command **To the right**, the rear-rank men march backward four steps. At the command **March**, all execute **Right face** and the leading man of each rank steps off. The other men step off in succession, each following the preceding man at 4 paces, rear-rank men marching abreast of their file leaders.

At the command **To the right**, the file closers march backward eight steps and at the command **March**, face to the right. Each steps off with the file nearest him.

When armed, at the command **March**, the leading man in each rank comes to the *trail* and executes a complete right face and, without coming to the *order*, steps off.

At the command **Halt**, given when all have their intervals, all halt and face to the front; when armed, all retain their rifles at the *trail* until the face to the front is completed.

b. The unit being at intervals, the command to assemble is: 1. **Assemble to the right (left)**, 2. **MARCH.** At the command **March**, the front-rank man on the right stands fast. The rear-rank man on the right closes to 40 inches. The other men face to the right in marching, close by the shortest line, halt and face to the front. The left hand is raised as in dressing to secure accuracy of interval; it is then dropped quickly to the side. File closers resume their positions in line, moving by the most direct route. If armed, the movement is executed with the rifles at the *trail* without such command.

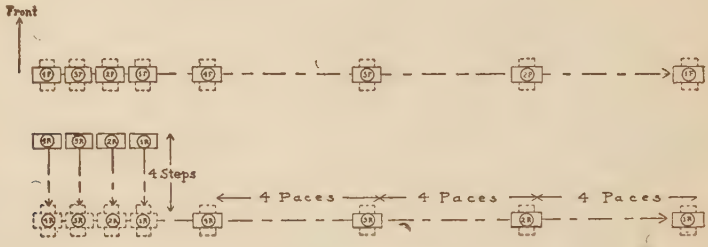


FIG. 28.—Take interval

3–9. To take distance.—Being in line at a halt and having counted off: 1. **Take distance**, 2. **MARCH**, 3. **Squad**, 4. **HALT.**

At the command **March** No. 1 of the front rank moves straight to the front; Nos. 2, 3, and 4 of the front rank and Nos. 1, 2, 3, and 4 of the rear rank, in the order named, move straight to the front, each stepping off so as to follow the preceding man at 4 paces. The command **Halt** is given when all have their distances.

In case more than one squad is in line, each squad executes the movement as above. The guide of each rank of numbers s right.

3–10. Being at distances, to assemble the squad: 1. **Assemble**, 2. **MARCH.** No. 1 of the front rank stands fast; the other numbers move forward to their proper places in line.

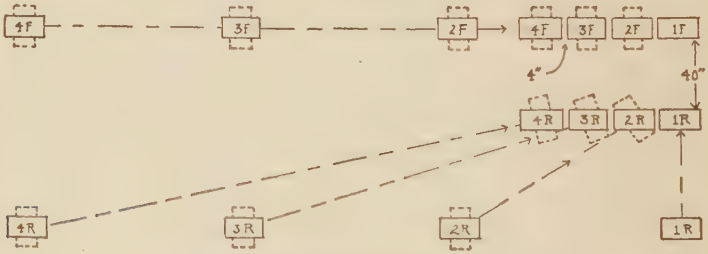


FIG. 29.—Assemble to the right

3–11. To stack and take arms.—*a.* The unit being in line at a halt to stack arms, the command is: 1. **Stack**, 2. **ARMS.** At the command **Arms**, each even number of the front rank grasps his rifle with the left hand at the upper band and rests the butt between his feet, barrel to the front, muzzle inclined slightly to the front and opposite the center of the interval on his right, the thumb and forefinger raising the stacking swivel. Each even number of the rear rank then passes his rifle, barrel to the rear, to his file leader, who grasps it between the bands with his right hand and throws the butt about 2 feet in advance of that of his own rifle and opposite the right of the interval; at the same time he allows the right hand to slip to the upper band, the thumb and forefinger raising the stacking swivel; he engages the stacking swivel with that of his own rifle. Each odd number of the front rank raises his rifle with the right hand, carries it well forward, barrel to the front; the left hand guiding the stacking swivel, engages the lower hook of the swivel of

his own rifle with the free hook of that of the even number of the rear rank; he then turns the barrel outward into the angle formed by the other two rifles and lowers the butt to the ground, so that it will be to the right of and against the toe of his right shoe.

The stacks made, the loose pieces are laid on them by the even numbers of the front rank.

When each man has finished handling the pieces, he takes the position of attention.

b. The unit being in line behind the stacks to take arms, the command is: 1. **Take**, 2. **ARMS.** At the command **Arms** the loose pieces are returned by the even numbers of the front rank. Each even number of the front rank grasps his own rifle with the left hand, the rifle of his rear-rank man with the right hand, holding both between the bands; each odd number of the front rank grasps his rifle in the same way with the right hand, disengages it by raising the butt from the ground, and then turning the rifle to the right, detaches it from the stack. Each even number of the front rank then disengages and detaches his rifle by turning it to the left, and passes the rifle of his rear-rank man to him. As each man receives his piece he resumes the order.

Should any squad have Nos. 2 and 3 blank files, No. 1 rear rank takes the place of No. 2 rear rank in making and breaking the stack. After the stacks are made or broken he resumes his post.

Rifles are never stacked with the bayonets fixed.

3–12. The oblique march.—*a.* For the instruction of recruits, the squad being in column or correctly aligned, the instructor causes each man to face half right or half left, points out his position, and explains that it is to be maintained in the oblique march.

b. The squad being in any formation, the command to oblique is: 1. **Right (left) oblique**, 2. **MARCH.** At the command **March**, each man faces half right in marching and steps off in a direction of 45° to the right of his original front. He preserves his relative position, keeping his shoulders parallel to those of the guide (the man on the right front of the line or column) and so regulates his step that the ranks remain parallel to their original front.

c. At the command **Halt**, the men halt faced to the front. The command **Halt** is given on the left foot when halting from the right oblique and on the right foot when halting from the left oblique.

d. To resume the original direction the command is: 1. **Forward**, 2. **MARCH.** At the command **March**, the men half face to the left in marching and then move straight to the front.

e. If at **half step** or **mark time** while, obliquing, the oblique march is resumed by the command: 1. **Oblique**, 2. **MARCH.**

The Squad—To turn on a moving pivot—Squad right (left) turn

3–13. To turn on a moving pivot.—*a.* The unit being in line to turn on a moving pivot, the command is: 1. **Right (left) turn**, 2. **MARCH.** The movement is executed by each rank successively and on the same ground. At the command **March**, the pivot man of the front rank faces to the right in marching, takes one full step and then takes eight half steps. The other men of the rank oblique to the right until opposite their places in line, then execute a second right oblique, and take the half step on arriving abreast of the pivot man. The marching flank arrives abreast of the pivot man when the latter has taken eight half steps. On the tenth count all take the full step without command.

(1) When executed from a halt: The count begins on the beat next following the command of execution, and the evolution is begun with the left foot. The tenth count, on which the leading rank steps off at a full step in the new direction, therefore requires a step with the right foot.

(2) When executed while in march: The count begins on the second step after the command of execution, the beat between the command and the count **One** being designated as **Step.** This beat requires a full step to the front by all members of the rank. If the turn is to the right, the command of execution is given as the right foot strikes the ground, and the step forward is therefore on the left foot. The count of **One** on which the evolution commences, falls on the right foot, and the **Tenth** count, on which all members of the rank step off in the new direction, is with the left foot. If the turn is to the left, the tenth count is with the right foot.

(3) The execution of the evolution, step by step, whether from a halt *or* while in march (the turn being to the right), is as follows:

At the count **One**, in the leading rank, No. 1 executes right face in marching and takes a full step in the new direction; No. 2 executes right oblique and takes a full step; No. 3 executes right oblique and takes a full step; No. 4 executes right oblique and takes a full step; and all other ranks take a full step to the front.

At the count **Two**, in the leading rank, No. 1 takes a half step in the new direction; No. 2 takes a short step in the oblique direction, which places him directly ahead of No. 1 of the second rank, and at proper distance from the flank toward

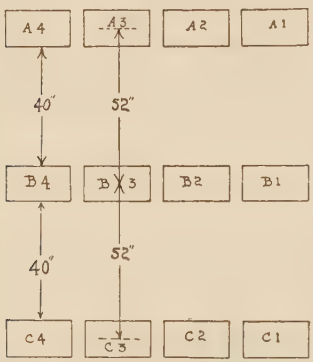


FIG. 30.—Column right or squad right turn. Position at MARCH or STEP

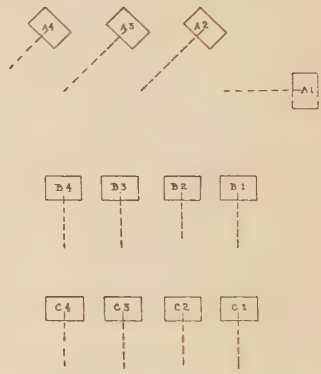


FIG. 31.—Column right or squad right turn at count One

the pivot; No. 3 takes a full step in the oblique direction; and No. 4 takes a full step in the oblique direction. The second rank takes a short step to the front, which places them at the pivot point. All other ranks take a full step to the front.

At the count **Three**, in the leading rank, No. 1 takes a half step; No. 2 executes right oblique and takes a full step; No. 3 takes a short step in the oblique direction, placing him at proper distance toward the flank from the pivot; No. 4 takes a full step in the oblique direction. The second rank begins the evolution on this count, just two counts after the rank ahead began. Members of this rank

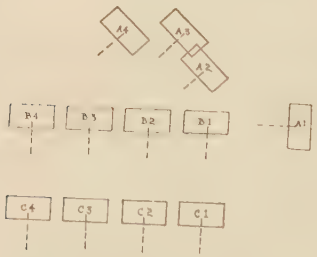


FIG. 32.—Column right or squad right turn at count Two

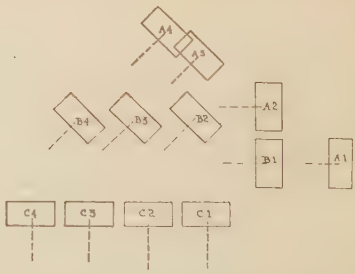


FIG. 33.—Column right or squad right turn at count Three

execute steps required of corresponding numbers of leading rank for the count **One**. All following ranks take a full step to the front.

At the count **Four**, in the leading rank, No. 1 takes a half step; No. 2 takes a full step; No. 3 executes right oblique and takes a full step; and No. 4 takes a short step in the oblique direction, placing him at proper distance toward the flank from the pivot. The second rank executes steps required of corresponding numbers of leading rank for count **Two**. The third rank takes a short step to the front, placing them at the pivot point. All following ranks take a full step to the front.

At the count **Five**, in the leading rank, No. 1 takes a half step; No. 2 takes a full step to come abreast of No. 1; No. 3 takes a full step; and No. 4 executes right oblique and takes a full step. The second rank executes steps as for the count **Three**. The third rank executes steps as for count **One**. All following ranks take a full step to the front.

At the count **Six**, in the leading rank, No. 1 takes a half step; No. 2 takes a half step; No. 3 takes a full step; and No. 4 takes a full step. The second rank executes steps as for count **Four**. The third rank executes steps as for count **Two**. The fourth rank takes a short step up to line of pivot. All following ranks take a full step to the front.

At the count **Seven** in the leading rank, No. 1 takes a half step; No. 2 takes a half step; No. 3 takes a full step to come abreast of No. 2; and No. 4 takes a full step. The second rank executes steps as for the count **Five**. The third rank executes steps as for count **Three**. The fourth rank executes steps as for count **One**. All following ranks take full step to the front.

At the count **Eight**, in the leading rank, No. 1 takes a half step; No. 2 takes a half step; No. 3 takes a half step, and No. 4 takes a full step. The second rank executes steps as for count **Six**. The third rank executes steps as for count **Four**. The fourth rank executes steps as for count **Two**. The fifth rank takes a short step up to line of pivot. All following ranks take a full step to the front.

At the count **Nine**, in the leading rank, No. 1 takes a half step; No. 2 takes a half step; No. 3 takes a half step; and No. 4 takes a full step to come abreast of No. 3. The second rank steps as for count **Seven**. The third rank steps as for count **Five**. The fourth rank steps as for count **Three**. The fifth rank steps as for count **One**. All following ranks take a full step to the front.

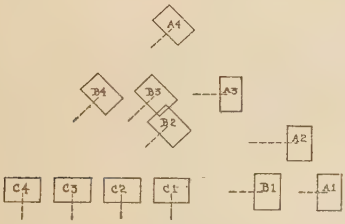


FIG. 34.—Column right or squad right turn at count Four

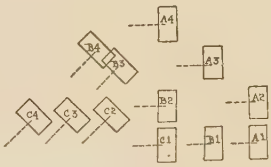


FIG. 35.—Column right or squad right turn at count Five

At the count **Ten**, in the leading rank, all take a full step to the front. The second rank steps as for count **Eight**. The third rank steps as for count **Six**. The fourth rank steps as for count **Four**. The fifth rank steps as for count **Two**. The sixth rank takes a short step up to the pivot point. All following ranks take a full step to the front.

b. **Right (left) half turn** is executed in a similar manner. The pivot man makes a half change of direction to the right and the other men make quarter changes in obliquing.

c. **General remarks.**—It should be noted that each rank reaches the pivot point two counts after the rank ahead—the shoulders of the successive ranks as they reach the pivot point should therefore "break" at every other beat.

If the evolution is performed exactly the same by every rank as it reaches the pivot point, with 40 inches between ranks, full steps 30 inches long, half steps 15 inches long, each man theoretically 12 inches from chest to back, then each rank will lose 8 inches distance on the rank ahead by the time the two ranks are both going ahead at the full step in the new direction. This is true of any two ranks in the column. Considering a platoon of five squads, marching in column of squads, to execute **Column right**, the rear rank of the leading squad loses 8 inches on the front rank, and each rank thereafter loses 8 inches more on the rank ahead, the rear rank of the last squad will have lost 72 inches by the time all are at full step again. In order to avoid this undesirable increase of distance between ranks and consequent lengthening of the column, the leading rank must perform the steps exactly as laid down, but in all following ranks, each man must close to a distance of 10 inches from the man ahead (measured from back of one to chest of the other) before taking up the half step. The men on the marching flank, who have no

half steps scheduled, must, after gaining the proper distance to the flank and turning in the new direction, increase their length of stride slightly, taking their guide on the pivot man of their respective ranks. The burden of judging the proper distance from the rank ahead lies with the pivot man in each rank. If each rank closes to 10 inches before the rank ahead takes up the full step (giving theoretical distance of 10 plus 6 plus 6 equals 22 inches), the rank ahead will gain 30 more inches by taking up the full step two counts ahead of the rank behind them and by the time both are at the full step, the distance between them will be 22 plus 30 equals 52 inches, the proper theoretical distance between ranks.

The count for each rank must be kept separately, and continued to its completion, each rank taking the full step to the front on the tenth count from the instant it began the turn. As the count for each rank is two counts less that of the rank ahead, each rank will step out its first full step to the front two counts after the rank ahead.

The **Count**, being at a halt: **MARCH, One** (full step in new direction), **Two** (half step), **Three, Four, Five, Six, Seven, Eight, Nine, Ten** (full step).

Being in **March: MARCH, Step** (to the front), **One** (full step in new direction), **Two** (half step), **Three, Four, Five, Six, Seven, Eight, Nine, Ten** (full step **to the front**).

The Squad—To turn on a fixed pivot—Squad right

3–14. To turn on a fixed pivot.—*a.* The unit being in line, to turn on a fixed pivot and march, the command is: 1. **Squad right (left)**, 2. **MARCH.** At the command **March**, the right-flank man in the front rank faces to the right in marching and marks time. The other front-rank men oblique to the right place themselves abreast of the pivot man and mark time. In the rear rank the third man from the right marches straight to the front three steps and one half step, then faces to the right in marching and marks time. The second and first men from the right oblique to the left, then oblique to the right so as to place themselves in column in the order named behind the third man. On the fifth count all face to the right in marching and cover their file leaders. The other number of the rear rank marches straight to the front four full steps, obliques to the right and by a second oblique to the right places himself abreast of the men on his right, and covers his file leader. On the sixth count both ranks execute **Forward march** without command.

(1) When executed from a halt: The entire squad steps off with the left foot. The count begins on the beat next following the command of execution. On movements from a halt, whether the turn is to the right or left, the left foot falls on the odd counts. The sixth count, on which the entire squad steps off in the new direction, therefore requires a full step forward with the right foot.

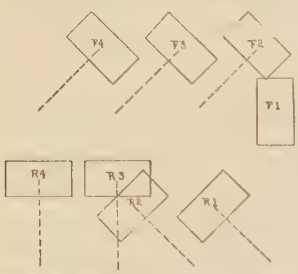


FIG. 36.—Squad right at count One

(2) When executed while in march: If the turn about is to the right, the command of execution is given as the right foot strikes the ground; if to the left, as the left foot strikes the ground. The count begins on the second step after the command of execution, the beat between the command and the first count being designated as **Step.** The execution of the evolution does not commence until the first count, the intervening step being a full step to the front by all members of the squad. If the turn is to the right, the count of **One** will fall on the right foot—the sixth count, on which all step off in the new direction will therefore require a full step with the left foot. If the turn is to the left, the count of **One** will fall on the left foot, and the sixth count on the right, the step off being made with that foot.

(3) The execution of the evolution, step by step, whether from a halt *or* while in march (the turn being to the right), is as follows: At the count **One** in the front rank, No. 1 executes right face and marks time; No. 2 executes right oblique, taking one full step; No. 3 executes right oblique, taking one full step; and No. 4 executes right oblique, taking one full step. In the rear rank, No. 4 takes one step to the front; No. 3 takes one step to the front; No. 2 executes left oblique and takes one full step; and No. 1 executes left oblique and takes one full step.

At the count **Two** in the front rank, No. 1 marks time; No. 2 takes short step into his position in line; No. 3 takes a full step in the oblique direction; and No. 4 takes a full step in the oblique direction. In the rear rank No. 4 takes his second full step to the front; No. 3 takes his second full step to the front; No. 2 takes a full step into position directly behind No. 3; and No. 1 takes his second step in the left oblique.

At the count **Three**, in the front rank, No. 1 marks time; No. 2 executes half right face and marks time; No. 3 takes a short step into his position in line; and No. 4 takes his third full step in the oblique direction. In the rear rank, No. 4 takes his third full step to the front; No. 3 takes his third full step to the front;

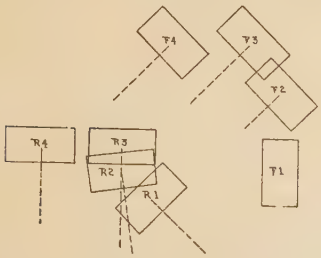


FIG. 37.—Squad right at count Two

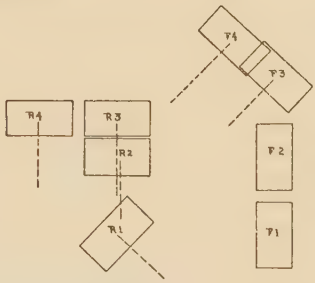


FIG. 38.—Squad right at count Three

No. 2 executes right oblique and takes one full step to the front, thus placing himself directly behind No. 3 rear rank and abreast of the No. 2 front rank; No. 1 takes a short step in the oblique direction, thus placing himself directly behind No. 2 rear rank and abreast of No. 1 front rank.

At the count **Four**, in the front rank, No. 1 marks time; No. 2 marks time; No. 3 executes half right face and marks time; and No. 4 takes a short step into his position in line. In the rear rank, No. 4 takes his fourth full step to the front; No. 3 takes a half step to the front, thus coming abreast of No. 3 front rank; No. 2 marks time; and No. 1 executes half right face and marks time.

At the count **Five**, in the front rank, No. 1 marks time; No. 2 marks time; No. 3 marks time; and No. 4 executes half right face and marks time. In the rear

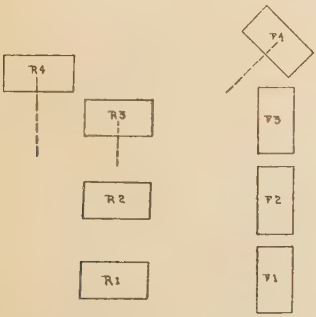


FIG. 39.—Squad right at count Four

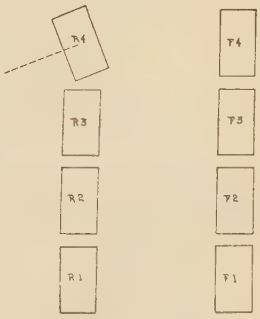


FIG. 40.—Squad right at count Five

rank, No. 4 executes right oblique and takes a full step into his position in line covering No. 4 front rank; No. 3 executes right face and marks time; No. 2 executes right face and marks time; and No. 1 executes right face and marks time. **All step out a full step to the front on the sixth count.**

b. The unit being in line to turn on a fixed pivot and halt, the command is: 1. **Squad right (left)**, 2. **MARCH**; 3. **Squad**, 4. **HALT**. The third command is given immediately after the command **March**. The turn is executed as prescribed in the preceding paragraph except that all men, on arriving on the new line, mark time until the command **Halt** is given, when all halt. The command **Halt** should be given on the fourth count.

The Squad—To turn about on a fixed pivot—Squad right about

3–15. The unit being in line to turn about and march, the command is: 1. **Squad right (left) about**, 2. **MARCH.** At the command **March** the front rank executes **Squad right.** On the fifth count the front rank executes a second **Squad right.** In the rear rank the third man from the right marches straight to the front three steps and one half step, changes direction to the right, and takes three steps and one half step in the new direction. The second and first men from the right oblique to the left, then oblique to the right so as to follow the third man in column, as in squad right. On the ninth count all three men face to the right in marching, cover their file leaders, and mark time. The other number of the rear rank marches straight to the front four steps, obliques to the right one step, completes the change of direction to the right, marches four steps in the new direction, obliques to the right, places himself abreast of the men on his right, and covers his file leader. On the eleventh count both ranks execute **Forward march** without command.

(1) When executed from a halt: The entire squad steps off with the left foot, the count beginning on the beat next following the command of execution. The **Eleventh** count, on which the entire squad steps off in the new direction, therefore requires a full step with the left foot, whether the about turn is to the right or left.

(2) When executed while in march: If the turn about is to the right, the command of execution is given as the right foot strikes the ground; if to the left, as the left foot strikes the ground. The count begins on the second step after the command of execution, the beat between the command and the first count being designated as **Step.** The execution of the evolution does not commence until the first count **One**, the intervening step being a full step to the front by all members of the squad. If the turn about is to the right, the count of **One** will fall on the right foot and the count of **Eleven** also on the right foot. The entire squad steps off in the new direction on the eleventh count. If the turn about is to the left, the step off in the new direction is on the eleventh count with the left foot.

(3) The execution of the evolution, step by step, whether from a halt or while in march (the turn about being to the right), is as follows: At the count **One** in the front rank, No. 1 executes right face and marks time; No. 2 executes right oblique, taking one full step; No. 3 executes right oblique, taking one full step; and No. 4 executes right oblique, taking one full step. In the rear rank No. 4 takes one step to the front; No. 3 takes one step to the front; No. 2 executes left oblique and takes one full step; and No. 1 executes left oblique and takes one full step.

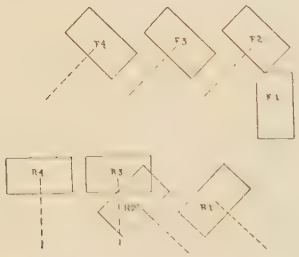


FIG. 41.—Squad right about at count One

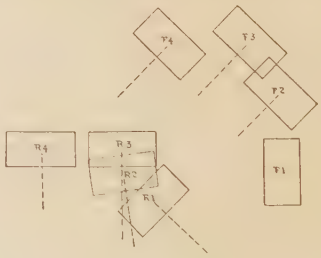


FIG. 42.—Squad right about at count Two

At the count **Two**, in the front rank, No. 1 marks time; No. 2 takes short step into his position in line; No. 3 takes a full step in the oblique direction; and No. 4 takes a full step in the oblique direction. In the rear rank, No. 4 takes his second full step to the front; No. 3 takes his second full step to the front; No. 2 takes a full step into position directly behind No. 3; and No. 1 takes his second step in the left oblique.

At the count **Three**, in the front rank, No. 1 marks time; No. 2 executes half right face and marks time; No. 3 takes short step into his position in line; and No. 4 takes his third full step in the oblique direction. In the rear rank, No. 4 takes his third full step to the front; No. 3 takes his third full step to the front; No. 2 executes right oblique and takes one full step to the front, thus placing himself directly behind No. 3 rear rank and abreast of the No. 2 front rank;

No. 1 takes a short step in the oblique direction, thus placing himself directly behind No. 2 rear rank and abreast of No. 1 front rank.

At the count **Four**, in the front rank, No. 1 marks time; No. 2 marks time; No. 3 executes half right face and marks time; and No. 4 takes a short step into his position in line. In the rear rank, No. 4 takes his fourth full step to the front; No. 3 takes a half step to the front, thus coming abreast of No. 3 front rank; No. 2 marks time; and No. 1 executes half right face and marks time.

At the count **Five**, in the front rank, No. 1 executes right face and marks time; No. 2 executes right oblique, taking one full step; No. 3 executes right oblique,

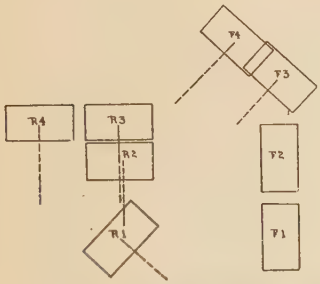


FIG. 43.—Squad right about at count Three

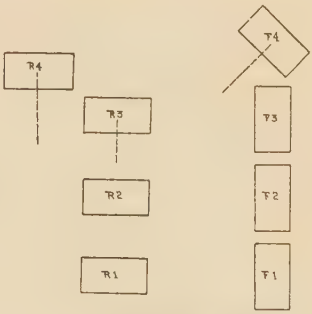


FIG. 44.—Squad right about at count Four

taking one full step and No. 4 executes column right, taking one full step. In the rear rank, No. 4 executes right oblique and takes a full step; No. 3 faces to the right and takes a full step; No. 2 executes right oblique and takes a full step; and No. 1 executes right oblique and takes a full step.

At the count **Six**, in the front rank, No. 1 marks time; No. 2 takes short step into his position in line; No. 3 takes a full step in the oblique direction; and No. 4 takes a full step in the oblique direction. In the rear rank, No. 4 executes right oblique and takes a full step; No. 3 takes a full step to the front; No. 2 takes

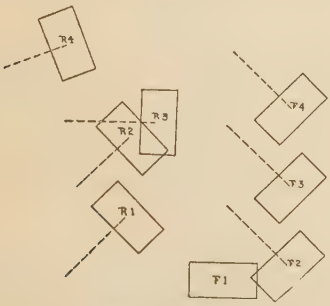


FIG. 45.—Squad right about at count Five

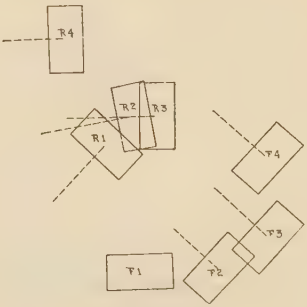


FIG. 46.—Squad right about at count Six

a full step into position directly behind No. 3; and No. 1 takes a full step in the oblique direction.

At the count **Seven**, in the rear rank, No. 4 takes a full step to the front; No. 3 takes a full step to the front; No. 2 executes right oblique and takes full step to the front, thus placing himself directly behind No. 3 rear rank and abreast of No. 2 front rank; No. 1 takes a short step in the oblique direction thus placing himself directly behind No. 2 rear rank and abreast of No. 1 front rank. In the front rank, No. 1 marks time; No. 2 executes half right face and marks time; No. 3 takes a short step into his position in line; and No. 4 takes a full step in the oblique direction.

At the count **Eight**, in the rear rank, No. 4 takes a full step to the front; No. 3 takes a half step to the front thus coming abreast of No. 3 front rank; No. 2 marks time; and No. 1 executes half right face and marks time. In the front rank, No. 1 marks time; No. 2 marks time; No. 3 executes half right face and marks time; and No. 4 takes a short step into his position in line.

At the count **Nine**, in the rear rank, No. 4 takes a full step, to the front; No. 3 executes right face and marks time; No. 2 executes right face and marks time;

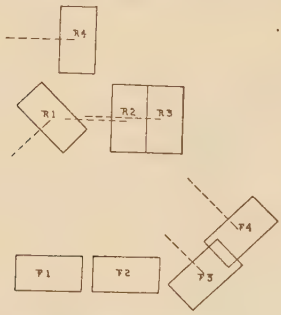


Fig. 47.—Squad right about at count Seven

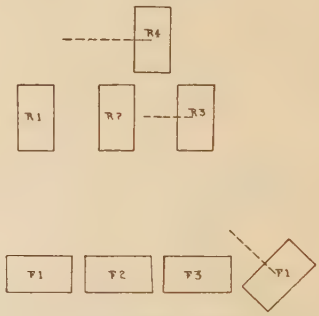


Fig. 48.—Squad right about at count Eight

and No. 1 executes right face and marks time. In the front rank, No. 1 marks time; No. 2 marks time; No. 3 marks time; and No. 4 executes half right face and marks time.

At the count **Ten**, in the rear rank, No. 4 executes right oblique and takes full step into his position in line, covering No. 4 front rank; No. 3 marks time; No. 2 marks time; and No. 1 marks time. In the front rank, No. 1 marks time; No. 2 marks time; No. 3 marks time; and No. 4 marks time. **All step out a full step to the front on the eleventh count.**

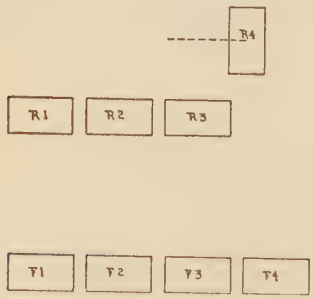


Fig. 49.—Squad right about at count Nine

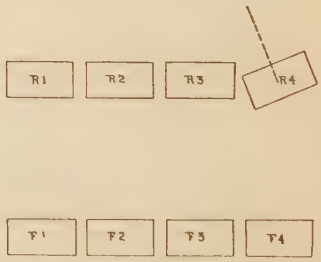


Fig. 50.—Squad right about at count Ten

The unit being in line to turn about and halt, the command is: 1. **Squad right (left) about**, 2. **MARCH**, 3. **Squad**, 4. **HALT**. The third command is given after the completion of the first squad, right. The turn is executed as prescribed in the preceding paragraph except that all men, on arriving on the new line, mark time until the command **Halt** is given. The command **Halt** should be given on the ninth count.

Section II. THE RIFLE PLATOON

3-16. Organization.—*a.* The rifle platoon at war strength comprises a platoon headquarters and six squads.

b. The platoon headquarters comprises 1 officer (platoon leader), 1 platoon petty officer (second in command), and 4 riflemen (runners).

c. In each platoon men are arranged, as far as practicable, according to height from right to left, the tallest on the right. Departures from this rule are author-

ized for the purpose of assigning men to duties which they are best fitted to perform and in order to maintain the integrity of squads. If any squad contains fewer than six men, it is either increased to that number by transfers from other squads or from the file closers, or it is broken up and its members assigned to other squads or posted in the line of file closers. These squad organizations are maintained by transfers, if necessary, until the platoon becomes so reduced in numbers as to necessitate a new division into squads. No squad contains fewer than six men.

d. For the purpose of formations or drill the runners may be used to fill blank files.

e. Individual duties.—(1) The platoon 1. p. o. is second in command of the platoon. He forms the platoon and receives the reports of squad leaders at all formations and, from his post in the file closers, supervises its drill and assists the platoon leader in control.

(2) The platoon guides are responsible for the proper direction and step of the platoon. When sections drill as platoons or independently the platoon guides becomes section leaders and, as such, drill and control their sections.

(3) The section guides are file closers during platoon and company drill except when the sections drill as platoons, as stated in paragraph 3–18*b*. They assist in control by cautioning and correcting whenever necessary.

(4) The squad leaders are responsible for control of their squads. They repeat such commands of platoon leaders as are hereinafter prescribed.

(5) The runners are file closers during drill unless temporarily assigned to squads.

(6) All petty officers in the file closers assist in control of the platoon by cautioning and correcting whenever necessary. Other file closers post themselves as illustrated in Figure 51 and conform to the movements of the platoon as hereinafter prescribed.

f. The platoon in line is formed in double rank. It is divided into squads beginning on the right flank. Platoons of more than three squads are divided into two sections. If the number of squads in the platoon is even the sections comprise an equal number of squads. If the number of squads is odd the right section is the stronger.

g. Each section at war strength comprises a section headquarters and three squads.

h. The section headquarters comprises one 1. p. o. (section leader) and one 2. p. o. (section guide).

i. Sections and squads are numbered consecutively from right to left in each platoon. These designations do not change. For convenience in giving commands and for reference, the designations **right center** and **left** when in line, and **leading center** and **rear** when in column are used to designate the actual right, center, left, leading or rear section or squad.

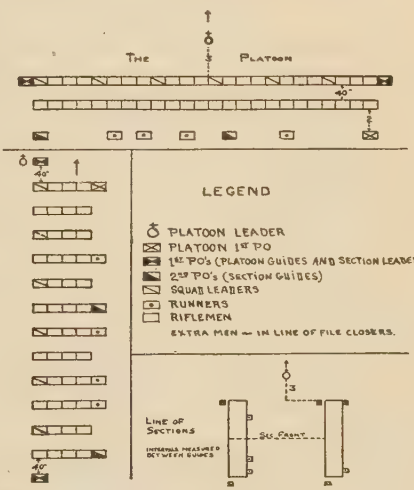


FIG. 51.—The platoon

3–17. To size the platoon.—The instructor arranges the men according to height in column at facing distance, tallest man in front. Squad leaders place themselves according to height, the tallest as the seventh man, the others as every eighth man in rear. The instructor then commands: **1. In two ranks form platoon, 2. MARCH, 3. FRONT.**

At the command **March**, the first man faces to the left; the second man places himself in the rear rank covering the first at a distance of 40 inches; both place the left hand upon the hip; the other men close in quick time, and form alternately in front and rear rank, as explained for the first two. Each man halts upon arriving at his proper place, faces to the left, and executes right dress.

All men having formed, the instructor commands: **FRONT.** Each man turns his head and eyes to the front and drops his left hand by the side.

3–18. Formations.—*a.* The formations of the platoons are: Line, column of squads, twos or files. (See fig. 51.) The principal close order formations are the line and column of squads.

b. For the purpose of variation in platoon drills and for the purpose of instructing petty officers in the duties of higher command, platoon commanders may designate their sections as platoons, appointing the necessary guides and platoon leaders. The platoon may then be drilled as a company.

3–19. General rules for close order drill.—*a.* The platoon executes the **halt, rests, facings, steps** and **marchings, manual of arms, obliques, resumes the direct march, preserves alignments** and **stacks** and **takes arms**, as explained in chapters 2 and 3, in proper cases substituting in the commands, **platoon** for **squad.**

b. The same rule applies to sections, detachments, and details, in proper cases substituting their designations for **squad** in the commands. In the same manner these execute the movements prescribed for the platoon whenever practicable, in proper cases substituting their designations for **platoon** in the commands.

c. Except as provided in paragraph **3–18***b*, close order drill of sections in a platoon consists only of such movements as are necessary to be used in connection with extended order, and are executed according to the principles of drill of platoons in the rifle company substituting in the commands the name of the appropriate unit.

d. (1) *Rules for the guides.*—The guides of a column of squads place themselves on the flank opposite the file closers. To change guides and file closers to the other flank, the platoon leader commands: 1. **File closers on the left (right) flank,** 2. **MARCH.** At the command **March,** the file closers dart through the column and post themselves on the other flank; the platoon leader and guides change to the opposite flank.

(2) *Action of guides and file closes in executing movements from column and line.*—Guides and file closers, when necessary, lengthen their step to approximately 33 inches in order to contribute to the smoothness of movements. The following movements of guides and file closers, though not designated to be exact, add to the precision of platoon and company drill.

(*a*) *Being in line*: 1. **Squads right.** The right guide takes two steps forward, faces to the right in marching, takes one step, and marks time. The left guide takes two steps forward, faces to the right in marching, and marks time.

2. **Squads right about.** The right guide faces to the right in marching and takes two steps, faces to the right in marching, and marks time. The left guide takes post in the same manner, except that he delays execution of the movement so that he will not interfere with the rear rank of the left squad.

3. **Squads right, column right.** The right guide faces to the right in marching and takes two steps, faces the to right in marching, takes one step, and marks time; on the sixth count he takes one full step and then eight half steps. The left guide takes post as in squads right.

(*b*) *Being in column:* 1. **Squads right.** (*a*) When the guide is right the leading guide takes one step forward, faces to the right in marching, and marks time. The rear guide takes two steps forward, faces to the right in marching, and marks time.

(*b*) When the guide is left the leading guide takes one step forward, faces to the right in marching, takes two steps, and marks time. The rear guide takes two steps forward, faces to the right in marching, takes two steps, and marks time.

2. **Squads right about.** The leading guide takes one step forward, faces to the right in marching and takes two steps, faces to the right in marching and marks time. The rear guide takes post in the same manner. The file closers take two steps forward, face to the right in marching, take two steps in the new direction, again face to the right in marching, and mark time. They regulate their execution, marking time if necessary, so as not to interfere with the movements of adjacent squads.

3. **Column right.** (*a*) When the guide is right, the leading guide faces to the right in marching and then takes post by marching to the right oblique.

(*b*) When the guide is left, the leading guide marches by the right oblique until opposite his new line of march, when he executes a second right oblique.

4. **Right front into line.** The leading guide marches to the left oblique until opposite his post, takes up the half step until the leading squad comes abreast of him, when he takes up the full step.

5. **On right into line.** The leading guide faces to the right in marching and takes post by the most direct practicable route.

(3) The guide of a unit keeps direction by aligning two points directly in his front and marching on them.

e. Full step from half step or mark time.—In all movements requiring the half step or mark time by the platoon or any part of the platoon, the guides and file closers take the full step on the same count as the platoon, or part thereof with which connected.

f. In column of squads, each rank preserves the alignment toward the side of the guide.

g. Guides and enlisted men in the line of file closers execute the manual of arms during drill unless specially excused, when they remain at the order. During ceremonies they execute all movements of the manual.

h. In take intervals, the right and left guides, at the command **Take interval,** face about and post themselves on line with the file closers, face to the front, and execute subsequent movements with them.

3–20. Alignments.—*a.* The alignments are executed as prescribed in Section I, the guide being established instead of the flank file. The guide and the rear-rank man of the flank file, toward which the dress is made, keep their heads and eyes to the front, and the rear-rank man covers his file leader. The left guide and the rear-rank man of the left file do not bring up their left arms while dressing.

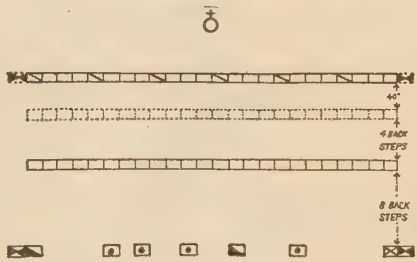


FIG. 52.—1. Take interval. 2. To the right. 3. MARCH. Formation taken at second command

b. Whenever the position of alignment necessitates a considerable movement, such movement, at the command to dress, is executed by marching to the front or oblique, to the flank or backward, as the case may be, without other command and at the *trail.*

c. At each alignment, the platoon leader verifies the alignment of the front rank, rear rank, and file closers of his platoon, executing a face in marching in moving to his successive positions. He posts himself in each case in prolongation of the rank, 2 paces from it and facing the point of rest. After having verified the alignment of the file closers, he faces to the right (left) in marching, moves to a point 3 paces beyond the front rank, halts, faces to the left (right) and from this position commands: **FRONT.**

The platoon leader then marches parallel to the front of his platoon until opposite its center, when he halts and faces to the front.

d. In opening ranks the platoon leader aligns his platoon as prescribed, except that after giving the command **Front,** he places himself 3 paces in front of the right guide and facing the front.

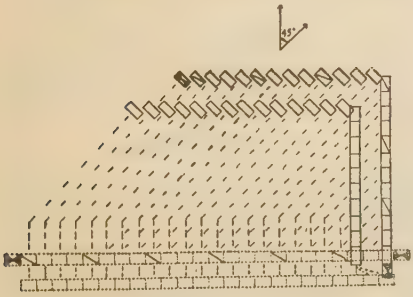


FIG. 53.—Platoon right

3–21. Movements from line.—*a.* The platoon being in line, to turn the platoon, the command is: 1. **Platoon right (left),** 2. **MARCH,** 3. **Platoon,** 4. **HALT,** or 3. **Forward,** 4. **MARCH.** Or instead of halting, the platoon may execute by proper command the steps and marchings prescribed and authorized in chapter 2.

(1) At the command **March,** the right guide steps back, takes post on the flank and marks time. The right squad executes squad right and marks time. The other front-rank men oblique to the right and, when in rear of their places on the new line established by the base squad, execute a second right oblique, place themselves on this line abreast of the pivot man, and mark time. The other men of the rear rank move straight to the front 4 paces, oblique to the right, place themselves on the new line established by the rear rank of the base squad, cover their file leaders, and mark time.

(2) The command **Halt** or **March** or the command involving other movement is normally given when the last man arrives on the line, except that the command **Halt** may be given at any time after the movement begins. Only those halt who have completed the movement. Each of the others halts upon arriving on the line, aligns himself to the right and executes **Front** without command.

(3) Men glance toward the pivot as they arrive on the line to maintain alignment.

b. The platoon being in line, to change direction the command is: 1. **Right (left) turn.** 2. **MARCH,** 3. **Platoon,** 4. **HALT,** or 3. **Forward,** 4. **MARCH.** Or the platoon may execute, by proper command, the steps and marchings prescribed and authorized in Chapter 2.

(1) This movement is executed by each rank successively and on the same ground.

(2) At the command **March,** the right guide faces to the right in marching and takes the half step. The other men of the rank oblique to the right until opposite their places in line, when they oblique to the right a second time. All take the half step on arriving abreast of the pivot man.

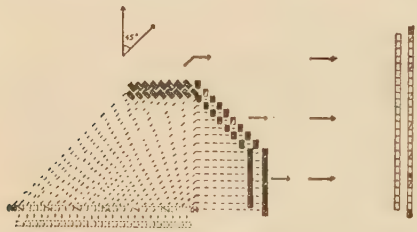


FIG. 54.—Right turn

(3) Each rear-rank man obliques on the same ground as his file leader.

(4) Men glance toward the point of rest as they arrive on the line to maintain alignment.

(5) The fourth command is given so that the halt or other movement will be executed as the last man arrives on the line.

c. The platoon being in line to form column of squads to a flank, the command is: 1. **Squads right (left),** 2. **MARCH,** 3. **Platoon,** 4. **HALT.** The movement is executed by each squad as prescribed in Section I. The file closers take post on the pivot flank abreast of and 4 inches from the nearest rank.

d. The platoon being in line to form column of squads and march to the rear, the command is: 1. **Squads right (left), column right (left),** 2. **MARCH.** The right squad initiates column right as soon as it has completed the squad right.

e. The platoon being in line, to form column of squads and march to the front the command is: 1. **Right (left) by squads,** 2. **MARCH.** At the command **March** the right squad marches forward, taking four full steps, then eight half steps, and then resumes the full step. The remainder of the platoon executes **Squads right, column left,** and follows the right squad. The right guide marches on the right flank of the right squad until four steps have been taken, when he moves by the left oblique and takes post in front of the left flank file.

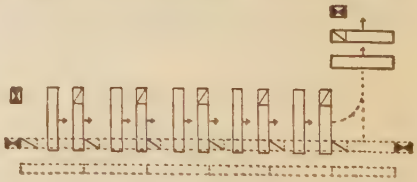


FIG. 55.—Right by squads

3–22. Movements from column of squads.—*a.* The platoon being in column of squads, to change direction, the command is:

(1) **Column right (left),** 2. **MARCH.** At the command **March** the front, rank of the leading squad turns to the right on a moving pivot, as in Section I. The other ranks, without command, turn successively on the same ground and in a similar manner.

b. The platoon being in column of squads, to form line to the front, the command is: 1. **Right (left) front line into,** 2. **MARCH,** 3. **Platoon,** 4. **HALT,** 5. **FRONT.**

(1) At the command **Right front into line** the leader of the leading squad, if halted, commands: **Forward.** If marching, he cautions: **Continue the march.** The leaders of the squads in rear command: **Right oblique.** At the command **March** the leading squad executes **Forward march,** or continues the march and the squads in rear execute **Right oblique.**

(2) The command **Halt** is given when the leading squad has advanced the desired distance. It halts. Its leader then commands: 1. **Left,** 2. **DRESS.** Each of the squads in rear when opposite its place in line by an oblique to the

left resumes the original direction at the command of its leader. Each is halted on the line at the command of its leader, who then commands: 1. **Left**, 2. **DRESS.** All dress on the first squad in line. The command **Dress** is given at such time after the command **Halt** as will allow the squad to execute the dress immediately after rifles have been brought to the order.

c. The platoon being in column of squads, to form line to a flank the command is: 1. **Squads right (left)**, 2. **MARCH.**

(1) The movement is executed by each squad as prescribed in Section I.

(2) If the platoon be formed in line toward the side of the file closers, they dart through the column and take posts in rear of the platoon at the command **March.**

(3) **When the execution of this movement in double time is ordered, the leading squad marches in quick time; the squads in rear march in double time to their places in line and then conform to the gait of the base squad. If the command Halt is given before the movement is completed, the squads on the line halt but do not dress; squads in rear are halted on the line and the men align themselves toward the point of the rest and execute Front without command.**

FIG. 56.—Right front into line

d. The platoon being in column of squads, to form line on right or left, the command is: 1. **On right (left) into line**, 2. **MARCH**, 3. **Platoon**, 4. **HALT**, 5. **FRONT.**

(1) At the command **On right into line** the leader of the leading squad commands: **Right turn.** The leaders of the squads in rear command: **Forward**, if at a halt. If marching, the leaders of the squads in rear caution: **Continue the march.** At the command **March** the leading squad turns to the right on a moving pivot. The command **Halt** is given when the leading squad has advanced the desired distance in the new direction. It halts. Its leader then commands: 1. **Right**, 2. **DRESS.** The squads in rear continue to march straight to the front. Each executes **Right turn** at the command of its leader when opposite the right of its place in line. Each is halted on the line at the command of its leader, who then commands: 1. **Right**, 2. **DRESS** All dress on the first squad in line. The command **Dress** is given at such time after the command **Halt** as will allow the squad to execute the dress immediately after rifles have been brought to the order.

(2) If executed in double time, the leading squad marches in double time until halted.

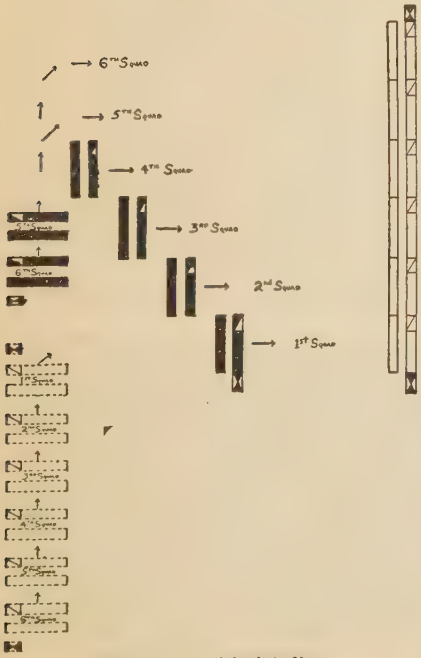


FIG. 57.—On right into line

3–23. Movements to the rear.—*a.* The platoon being in line, or column of squads, to face or march to the rear, the command is: 1. **Squads right (left) about,** 2. **MARCH,** or 1. **Squads right (left) about,** 2. **MARCH,** 3. **Platoon** 4. **HALT.**

(1)' The movement is executed by each squad as prescribed in Section I.

(2) If in line, each file closer darts through the nearest interval and takes post.

b. To march to the rear for a few paces, the command is: 1. **About,** 2. **FACE,** (3. **At trail**), 4. **Forward,** 5. **MARCH,** 6. **Platoon,** 7. **HALT.**

If in line, the guides place themselves in the rear rank, now the front rank. The file closers, on facing about, maintain their relative positions. No other movement is executed until the line is faced to the original front.

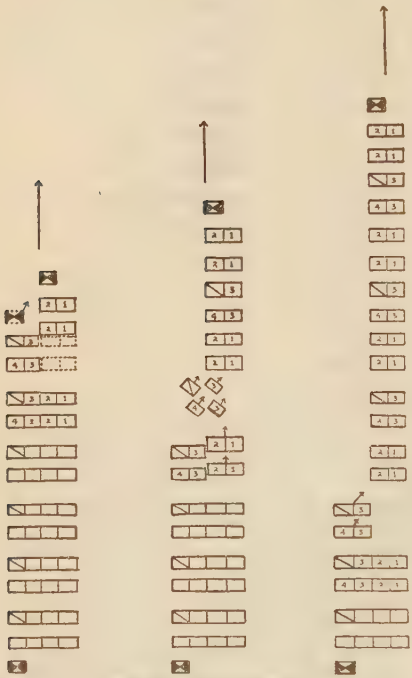


Fig. 58.—Right by twos

3–24. Movements at ease or at route step.—*a.* The column of squads is the habitual column of route, but **route step** and **at ease** are applicable to any marching formation.

b. To march in route step, the command is: 1. **Route step,** 2. **MARCH.** The men carry their pieces at will, keeping the muzzles elevated; they are neither required to preserve silence, nor to keep the step. Under favorable marching conditions platoons may be required to maintain cadence. The ranks cover and preserve distance. If halted from route step, the men stand **at rest.**

c. To march at ease, the command is: 1. **At ease,** 2. **MARCH.** The platoon marches as in route step, except that silence is preserved. When halted the men remain **at ease.**

d. Marching in route step or at ease, to resume attention, the command is: 1. **Platoon,** 2. **ATTENTION.** At the command **Attention,** the rifles are brought to the right shoulder, the automatic rifles are slung over the right shoulder, and the cadence step of quick time is resumed.

3–25. To diminish the front of a column of squads and the reverse.—*a.* The platoon being in column of squads, to diminish the front to a column of twos, the command is: 1. **Right (left) by twos,** 2. **MARCH.** At the command **March,** all files except the two right files of the leading squad execute **In place halt** or **Stand fast.** The two left files of the leading squad oblique to the right when disengaged and follow the right files at the shortest practicable distance. The remaining squads follow successively in like manner.

b. The platoon being in column of squads or twos, to diminish the front to a column of files, the command is: 1. **Right (left) by file,** 2. **MARCH.** At the command **March,** all files except the right file of the leading two or squad execute **In place halt** or **Stand fast.** The left file or files of the leading two or squad oblique successively to the right when disengaged, and each follows the file on its right at the shortest practicable distance. The remaining twos or squads follow successively in like manner. (Fig. 59.)

c. The platoon being in column of files or twos, to form column of squads; or being in column of files to form column of twos, the command is: 1. **Squads (twos) right (left) front into line,** 2. **MARCH.** At the command **March,** the leading file or files halt or stand fast. The remainder of the squad or two obliques to the right and halts on line with the leading file or files. The remaining squads or twos close up and successively form in rear of the first in like manner.

This movement is ordered right or left, so as to restore the files to their normal relative positions in the two or squad. (Fig. 60.)

d. The movements prescribed in the three preceding subparagraphs, 3–25, *a* *b*, and *c*, are difficult of execution at attention and have no value as disciplinary exercises.

Section III. THE RIFLE COMPANY

3–26. Organization.—*a.* The rifle company at war strength comprises three platoons of six squads each and company headquarters. This organization will be maintained until the number of squads in the company falls below nine. A company of fewer than nine and more than five squads will be organized into two platoons.

b. The administration of the company is based upon platoon and squad organization.

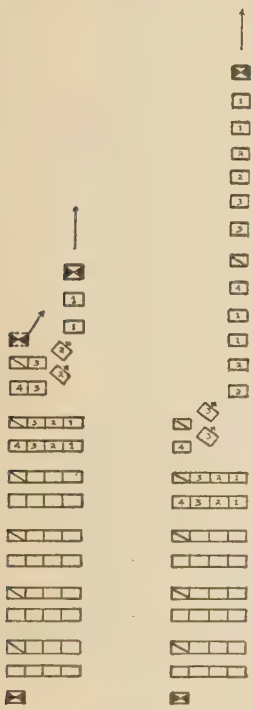


FIG. 59.—Right by file

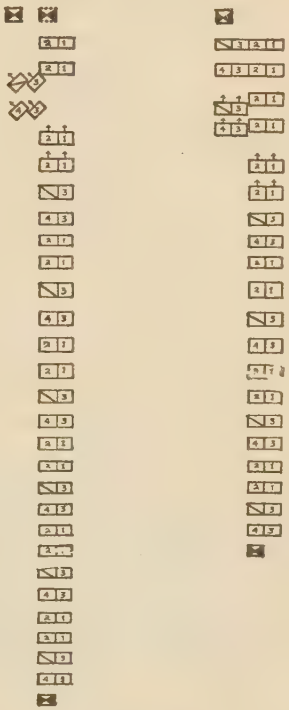


FIG. 60.—Squads left front into line

3–27. Formations.—*a.* The formations of the company are: Line, column of platoons, close column of platoons, line of platoons, close line of platoons, and column of squads. Of these formations, the first two are assembly, ceremonial, and drill formations. In close order drill, marching in line is exceptional; column of platoons is habitually employed for drilling troops in marching in line; close line is a suitable formation for street parades.

b. The company assembles in formation, in line or close column of platoons, as directed. (See fig. 61.)

c. At the formation of the company in line, platoons are numbered consecutively from right to left. These designations do not change.

d. For convenience in giving commands and for reference, the designations **right, center,** and **left,** when in line, and **leading, center,** and **rear,** when in column, are applied to the platoons. These designations apply to the actual **right, left, center, leading,** or **rear** platoon in whatever direction the company may be facing.

e. The three senior duty p. os. are assistants to the platoon leaders, one with each platoon, and are designated as platoon petty officers. The next in rank are assigned as guides, two to each platoon.

f. For close-order drill and ceremonies, unless otherwise directed, the members of the company headquarters are attached to platoons with a view to equalizing the strength thereof. Within the platoons members of the company headquarters are assigned to squads or placed in the file closers. For inspections the company headquarters may be formed and inspected separately as a fourth platoon, as shown in Figures 61 and 62.

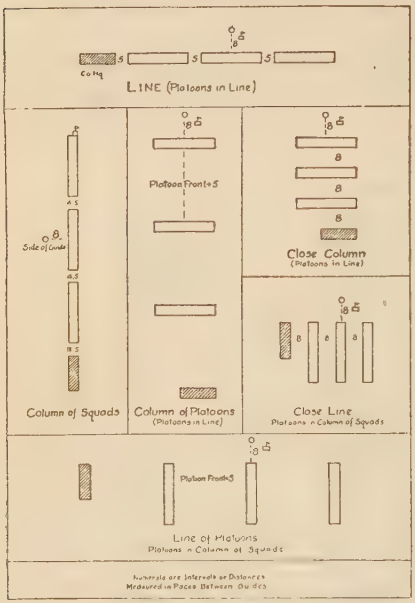


FIG. 61.—Formations of the company

g. A company of fewer than six squads is commanded by the company commander as a single platoon, but retains the designation of the company.

3–28. General rules for close-order drill.—*a.* Platoon leaders repeat such preparatory commands as are to be immediately executed by their platoons, such as **Forward** and **Squads right**, and the men execute the movement at the command of execution, such as **March** and **Halt**, if applying to their platoons, when given by the company commander. In movements executed in route step and at ease the platoon leaders repeat the command of execution if necessary. Platoon leaders do not repeat the company commander's commands in having the company stand at ease or at rest, having it fall out, stack arms, take arms, or in executing the manual of arms, nor those commands which are not essential to the execution of a movement by their platoons. Thus, at the company commander's command: **Column of squads, leading platoon squads right**, the platoon leader of the leading platoon repeats only the command **Squads right**. In giving commands or cautions platoon leaders may prefix the numbers of their platoons, as: **First platoon, halt**; or **Second platoon, squads right**.

b. At the command **Guide center** (**right** or **left**), platoon leaders command: **Guide right** or **left**, according to the positions of their platoons. **Guide center** designates the right guide of the center platoon, or the left guide of the right platoon if there are only two platoons.

FIG. 62

c. When platoons are to be dressed, platoon leaders place themselves on that flank toward which the dress is to be made 2 paces from the guide in prolongation of the line and facing the point of rest.

d. Each platoon leader dresses his platoon according to the principles prescribed in paragraph 3–20*c*. When the company commander so directs, dressing of the rear rank and file closers may be dispensed with.

e. In executing any movement or facing, in aligning units or in moving from one post to another, officers and petty officers maintain a military bearing and precision of movement.

f. If the company is in line, the following rules apply to the dressing of guides away from the point of rest:

(1) If the company is at the halt, at the command **Dress**, given by the platoon leader, unless otherwise prescribed as in paragraph **3–32**, the guide away from the point of rest comes to the right shoulder.

(2) Where it is prescribed that platoons dress after movements the guide away from the point of rest remains at the right shoulder when the platoon is halted.

(3) The guide dresses promptly on his platoon leader and the platoon beyond, thus establishing the line. During the dress he moves, if necessary, to the right and left only. The platoon leader dresses the platoon on the line thus established. The guide takes the position of order arms at the command **Front.**

g. The company executes the **halt, rests, facings, steps** and **marchings, manual of arms, stacks** and **takes arms,** as explained in chapters 2 and 3, in proper cases, substituting the commands **company** for **squad.**

h. The company executes **squads right (left), squads right (left) about** and **obliques** and resumes the **direct march,** as explained in Section II.

i. The company in column of squads, twos, or files changes direction, as explained for the platoon. The company in column of squads forms column of twos or files and re-forms column of twos or squads, as explained for the platoon, each platoon executing the movement successively.

j. When the formation admits of the simultaneous execution by platoons of movements prescribed in Section II, the company commander may cause such movement to be executed by prefixing, when necessary, **platoons** to the commands prescribed therein; such as, 1. **Platoons, right front into line,** 2. **MARCH.** To complete such simultaneous movements the commands **halt** or **march,** if prescribed, are given by the company commander. The command **front,** when prescribed, is given by the platoon leaders.

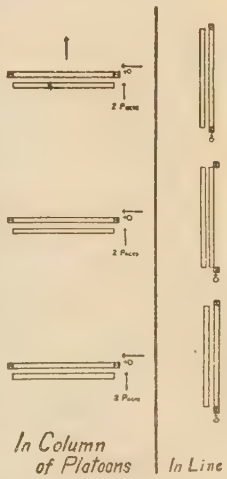


FIG. 63.—Position of platoon leaders during right dress

k. In successive movements into line, column of platoons, or close column of platoons, each platoon leader where applicable halts when opposite or at the point where the right (left) of his platoon is to rest and gives the necessary commands from this post for changing from column to line, so that the right (left) of his platoon will rest at the proper point.

l. In successive movements into line each platoon leader where applicable marches beside the guide toward the point of rest, after his platoon forms line or begins the change of direction.

m. Whenever commands are given involving movements of platoons in which one platoon stands fast or continues the march, the platoon leader commands: **Stand fast,** or cautions: **Continue the march,** as the case may be.

3–29. To form the company.—*a.* The c. p. o. takes position 6 paces in front of the point where the center of the company is to be, faces it and commands: **FALL IN.**

b. When the company is to be formed in line, the center guide places himself facing to the front so that the center of the company will be opposite and 6 paces from the c. p. o. The other guides place themselves at prescribed intervals from the center guide. When the company is to be formed in close column of platoons the right guide of the leading platoon places himself so that the center of his platoon will be opposite to and 6 paces from the c. p. o., and the right guides of the rear platoons place themselves so as to cover the right guide of the leading platoon at prescribed distances. Each platoon p. o. takes post 3 paces in front of the point where the center of his platoon will be. The platoons form in their proper places, under supervision of the platoon p. os. and guides.

c. The platoon p. os. then command: **REPORT.** Remaining in position at the order, the squad leaders, in succession from the right, in each platoon, report: "All present" or "_____ absent." The platoon p. os. then command: 1. **Inspection,** 2. **ARMS,** 3. **Order,** 4. **ARMS,** face about and, at the

command **Report**, given by the c. p. o., the platoon p. o. s. successively, beginning with the first platoon, report: "All present or accounted for, or — men absent."

d. All platoons and the headquarters detachment having reported, the c. p. o. commands: **POSTS.** The platoon p. os. take posts. The c. p. o. then faces about, and reports: "Sir, all present or accounted for," or "Sir, — men absent," and without command takes his post.

e. If the platoons can not be formed by squads, the platoon p. os. command: 1. **Inspection**, 2. **ARMS**, 3. **Right shoulder**, 4. **ARMS**, and calls the roll. Each man, as his name is called, answers "Here" and executes **Order arms** if armed with the rifle. The platoon p. o. then effects the division into squads and reports the platoon as described above.

f. The company commander places himself 12 paces in front of the center of and facing the company or the leading platoon, in time to receive the report of the c. p. o.

g. The platoon leaders take their posts when the c. p. o. has reported.

h. The petty officer in charge of the company headquarters detachment forms the detachment and reports as prescribed for the platoon p. os.

i. The company, not under arms, is formed in like manner, omitting reference to arms.

j. In forming the company all who are required to make a report salute and maintain same until the report is acknowledged.

3–30. To dismiss the company.—*a.* The company being in line or close column at a halt, the company commander directs the c. p. o.: **Dismiss the company.** The officers fall out; the c. p. o. moves to a point 6 paces in front of the center of the company or the leading platoon, salutes, faces toward the company and commands: 1. **Inspection**, 2. **ARMS**, 3. **Port**, 4. **ARMS**, 5. **DISMISSED.**

b. Dismissal may also take place by direction to the platoon leaders; by the company commander commanding: **Dismiss your platoons.** Each platoon is then dismissed as described for the company, the platoon p. os. performing the duties prescribed for the c. p. o. The headquarters detachment is dismissed by its leader.

3–31. To rectify the alignment.—The company being in line at a halt, to align the company, the command is: 1. **Center (right or left)**, 2. **DRESS.** The platoon leader of the base platoon dresses his platoon immediately.

The other platoon leaders dress their platoons successively toward the center (right or left) guide of the company, each as soon as the platoon leader of or next toward the base platoon commands: **FRONT.**

3–32. To give the company a new alignment.—1. **Guides center (right or left) platoon on the line**, 2. **Guides on the line**, 3. **Center (right or left)**, 4. **DRESS**, 5. **Guides**, 6. **POSTS.**

a. At the first command, the designated guides come to the trail, place themselves on the new line, face toward the center (right or left), and come to the **order arms.** The company commander establishes them in the direction he wishes to give the company.

b. At the command **Guides on the line**, the guides of the other platoons take posts in like manner, facing the center (right or left) so as to prolong the line.

c. At the command **Dress**, each platoon leader dresses his platoon to the flank toward which the guides of his platoon face. The right (left) front-rank man places his breast against the left (right) arm of the right (left) guide. The guides remain **at order arms.**

d. At the command **Posts**, given when all of the platoons have completed the dress, the guides take their posts.

3–33. To open and close ranks.—*a.* The company being in line or column of platoons, the command is: 1. **Open ranks**, 2. **MARCH.**

(1) When the company is in line, the platoon leader of the right platoon repeats the preparatory command of the company commander; other platoon leaders command: **Stand fast.**

At the command **March**, the right platoon opens ranks as prescribed for the platoon.

The other platoon leaders successively give the necessary commands for opening ranks, each as soon as the leader of or next toward the base platoon commands: **FRONT.**

In each platoon the guide away from the point of rest comes to the right shoulder and returns to the order according to the principles of aligning the company.

(2) When the company is in column of platoons, the leading platoon executes the movement as described above for the right platoon. Leaders of the platoons in rear of the leading platoon place their right guides so as to cover at the proper distance, and give the necessary commands for opening ranks.

Platoon guides remain at the order.

b. Ranks are closed as for the platoon.

3–34. **To rectify the column.**—The company being in column of platoons or in close column, at a halt, if the guides do not cover or have not their proper distances, and it is desired to correct them, the company commander commands: 1. **Right (left)**, 2. **DRESS.**

Leaders of the platoons in rear of the leading platoon place their right guides so as to cover at the proper distance; each platoon leader aligns his platoon to the right and commands: **FRONT.**

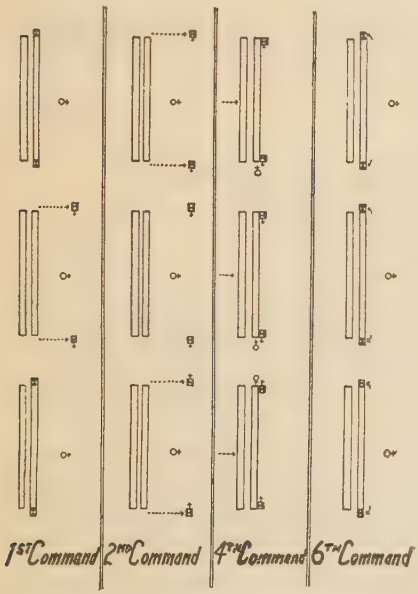


FIG. 64.—Giving the company a new alignment

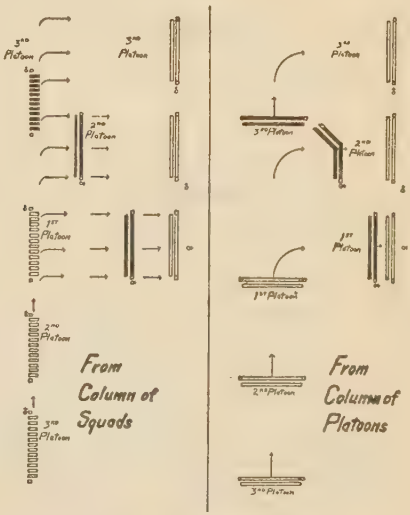


FIG. 65.—On right into line

3–35. **On right (left) into line.**—The company being in column of squads or platoons, to form line on the flank, the command is: 1. **On right (left) into line**, 2. **MARCH**, 3. **Company**, 4. **HALT.**

a. The company being in column of squads, at the command **On right into line**, the leader of the leading platoon commands: **Squads right.** If at a halt, each platoon leader in rear commands: **Forward.** At the command **March** the leading platoon marches in line to the right; the platoons in rear continue to march to the front until opposite their places to the left of the preceding platoon, when they are marched in line to the right and formed successively on the left.

The command **Halt** is given when the leading platoon has advanced the desired distance in the new direction; it halts and is dressed to the right by its leader. The other platoons complete the movement, each being halted one pace in rear of the line established by the leading platoon, and then dressed to the right.

b. The company being in column of platoons, at the command **On right into line**, the leader of the leading platoon commands: **Right turn.** If at a halt, each platoon leader in rear commands: **Forward.** Each of the platoon leaders in rear of the leading platoon gives the command: 1. **Right turn**, 2. **MARCH**, when his platoon arrives opposite the right of its place in line. The preparatory command is given in time to add the command **MARCH** at the moment of arrival in rear of its place in line.

The command **HALT** is given and the movement completed as explained above.

If the movement is executed in double time the leading platoon marches in double time until halted.

3–36. Front into line.—The company being in column of squads or platoons, to form line to the front, the command is: 1. **Right (left) front into line,** 2. **MARCH.**

a. The company being in column of squads, at the command **Right front into line,** all the platoon leaders command: **Column right.** At the command

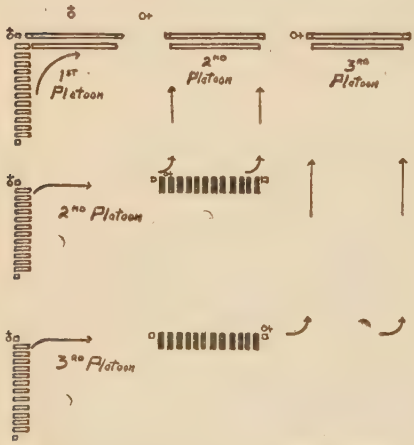


FIG. 66.—Right front into line. From column of squads

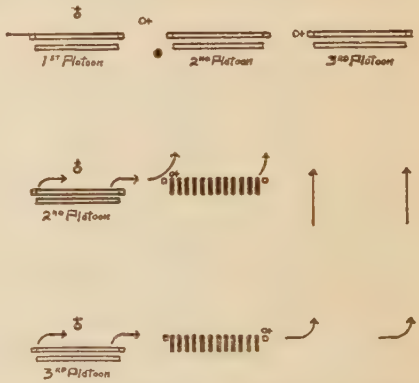


FIG. 67.—Right front into line. From column of platoons

March, the leading platoon executes **Column right** and, as the last squad completes the change of direction, is formed in line to the left, halted, and dressed to the left. The platoons in rear execute **Column right** at the command **March** and are similarly formed in line when opposite their respective places. They are halted when one pace in rear of the line established by the leading platoon and dressed to the left.

b. The company being in column of platoons, if marching, the leading platoon halts at the command **March.** The platoon leader dresses his platoon to the left.

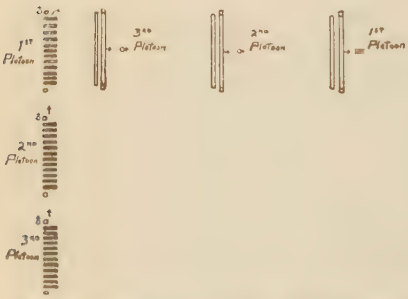


FIG. 68.—Column of platoons, leading platoon squads right

If at a halt, at the command **Right front into line,** the leader of the leading platoon commands: **Stand fast,** and the leader of each platoon in rear commands: **Squads right.** At the command **March,** the former dresses his platoon to the left and each of the latter conducts his platoon to its place in line as described above.

3–37. To form column of platoons successively to the right or left.—The company being in column of squads, to form column of platoons successively to the right or left, the command is: 1. **Column of platoons.** 2. **Leading platoon, squads right (left),** 3. **MARCH.**

At the command **March,** the leading platoon executes squads right and moves forward. The other platoons move forward in column of squads and successively march in line to the right on the same ground as the leading platoon and in such manner that the guide of each platoon covers the guide of the preceding platoon.

3–38. To form column of squads successively to the right or left.—The company being in column of platoons, to form column of squads successively to the right or left, the command is: 1. **Column of squads**, 2. **Leading platoon, squads right (left)**, 3. **MARCH.**

At the command **March**, the leading platoon executes squads right and moves forward. The other platoons move forward in column of platoons and successively march in column of squads to the right on the same ground as the leading platoon.

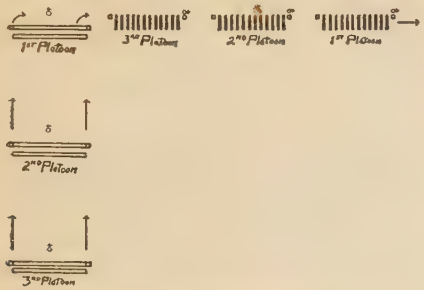


FIG. 69.—Column of squads, leading platoon, squads right

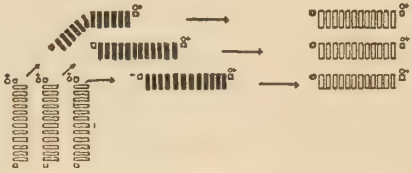


FIG. 70.—Company right. From close line

3–39. To change direction.—*a.* The company being in column of platoons or close column, to change direction, the command is: 1. **Column right (left)**, 2. **MARCH.**

At the command **Column right**, the leader of the leading platoon commands: **Right turn.** At the command **March** the leading platoon turns to the right on a moving pivot, the platoon leader adding: 1. **Forward**, 2. **MARCH**, upon completion of the turn.

The other platoons march squarely up to the turning point, each changes direction by the same commands and means as the first and in such manner that the right guide covers the right guide of the preceding platoon.

The guide changes to right, if not already there, as soon as the change in direction is begun by each platoon, and is so announced by each platoon leader.

If deemed desirable or necessary, the guide is announced **right** by the company commander prior to the execution of the movement.

b. The company being in line of platoons or close line, to change direction, the command is: 1. **Company right (left)**, 2. **MARCH**, 3. **Company**, 4. **HALT.** The right platoon changes direction to the right; the other platoons are marched by the shortest line to their places abreast of the first.

The command **Halt** is given when the right platoon has advanced the desired distance in the new direction; that platoon halts; the others halt successively upon arriving on the line.

c. Being in column of squads, the company changes direction by the same commands and in the same manner as prescribed for the platoon.

3–40. Mass formations.—*a.* The company being in line of platoons, to form in mass, the command is: 1. **Close on right (left) platoon**, 2. **MARCH**, 3. **Company**, 4. **HALT.**

At the command, **March** the right platoon moves straight to the front or in the direction indicated by the company commander; it halts at the command **Halt.**

At the command **Close on right platoon**, the other platoon leaders command: **Column half right.** At the command **March**, they conduct their platoons toward the right platoon in column and halt successively in close line. This movement should not be ordered unless the other platoons have sufficient distance to complete the second change of direction before being halted.

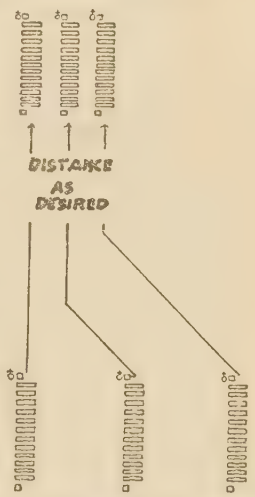


FIG. 71.—Close on left platoon. From line of platoons

b. The company being in line or in column of platoons, to form in mass, the command is: 1. **Close on right (left) (leading) platoon,** 2. **MARCH.**

The indicated platoon halts at the command **March,** or stands fast. The other platoons execute **Squads right column right** if in line, or **Forward** if in column of platoons, and are marched and halted successively in close column in its rear.

In close column, formed from line on the right platoon, the left guides cover. If the formation is made on the left platoon, the right guides cover. From column of platoons, the guide remains the same as before the formation.

c. The company being in column of squads, to form in mass, or at a designated interval, the command is: 1. **Line of platoon (so many paces),** 2. **Right (left),** 3. **MARCH,** 4. **Company,** 5. **HALT.**

At the command **March,** the leading platoon moves straight to the front or in the direction indicated by the company commander. It halts at the command **Halt.** At the command **Right,** platoon leaders in rear command: **Column half right.** At the command **March,** they march their platoons on the indicated flank in column and halt them successively at the prescribed interval, abreast of the leading platoon. To form close line, an interval of 8 paces is designated. If no interval be designated, the platoons form at intervals of platoon frontage plus 5 paces.

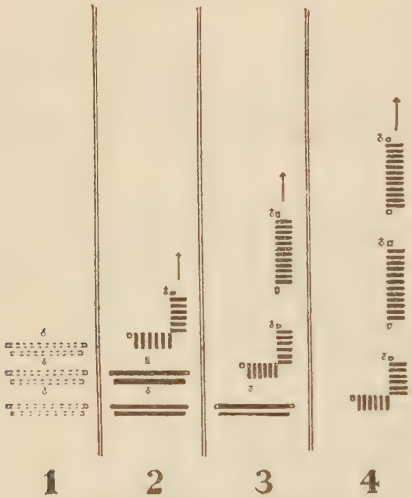


FIG. 72. Column of squads, leading platoon, right by squads. From close column

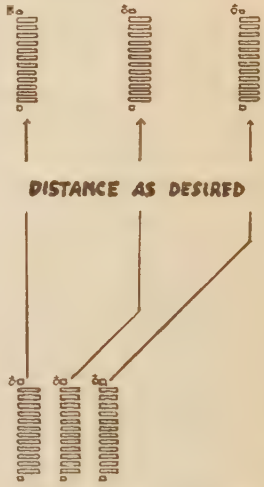


FIG. 73.—Extend on left platoon. From close line

3–41. To extend the mass.—*a.* The company being in close column, to extend the mass, the commands are—

(1) 1. **Extend on rear platoon,** 2. **MARCH.**

At the command **March,** the leading platoon moves straight to the front, and the platoons in rear halt or stand fast. They are successively moved forward in time to follow at full distance. The extension is made on the rear platoon only.

(2) 1. **Right (left) front into line,** 2. **MARCH.** Executed as from column of platoons. (See par. 3-33*b*.)

(3) 1. **Column of squads, leading platoon squads right (left),** 2. **MARCH** or 1. **Column of squads, leading platoon, right (left) by squads,** 2. **MARCH.**

In the first case at the command **March,** the leading platoon executes **Squads right** and moves forward. Each of the platoons in rear halts or stands fast and moves forward in time to execute squads right on the same ground as the leading platoon.

In the second case at the command **March,** the leading platoon executes **Right by squads.** Each of the platoons in rear halts or stands fast and executes the movement at the proper time to follow the platoon ahead of it.

(4) When the company is in close column the mass is not extended in double time.

b. The company being in close line, to extend the mass, the commands are—

(1) 1. **Extend on right (left) platoon,** 2. **MARCH,** 3. **Company,** 4. **HALT.**

At the command **March,** the right platoon moves straight to the front or in the direction indicated by the company commander. It halts at the command **Halt.**

At the command **Extend on right platoon,** the other platoon leaders command: **Column half left,** and at the command **March,** march their platoons away from the right platoon in column, halting them in their proper order in line of platoons abreast of the right platoon.

(2) 1. **Column of squads, right (left) platoon, forward,** 2. **MARCH.**

At the command **March,** the right platoon moves forward; the other platoons halt or stand fast and successively take up the march and follow in column.

c. For special purposes, close column or close line may be formed or extended at other than normal distance or interval by designating the distance or interval (so many paces) after the preparatory command for closing or extending.

3–42. Route step and at ease.—The company marches at route step and at ease as prescribed for the platoon. When marching in column of platoons, the guides maintain trace and distance.

In route marches, the file closers march at the head, or in rear, of their platoons or company.

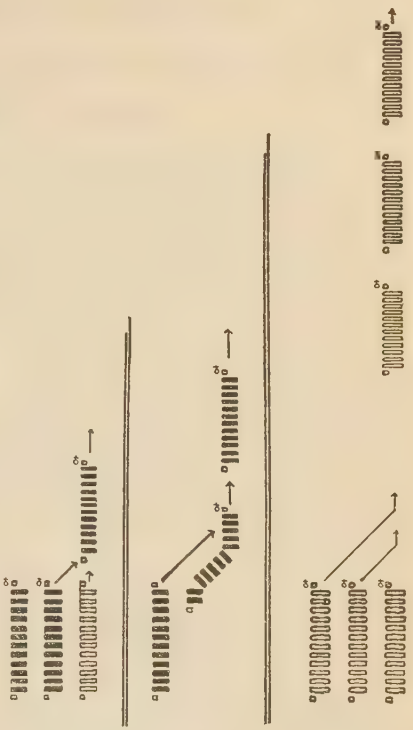


FIG. 74.—Column of squads, right platoon, forward. From close line

3–43. Assembly.—The company being wholly or partially deployed, or the platoons being separated, to assemble, the command is: 1. **Assemble,** 2. **MARCH.**

The company commander places himself opposite to, or designates, the element or point on which the company is to assemble. Platoons are assembled and marched to the indicated point. As the platoons arrive the company commander indicates the formation to be taken.

Chapter 4

DRILL, THE INFANTRY BATTALION, REGIMENT, BRIGADE, AND THE HEADQUARTERS COMPANY

[The subject of Reviews, Parades, Escorts, and Inspections is covered in ch. 5, Ceremonies and Inspections]

Section I.—GENERAL RULES

4–1. Commands and orders.—*a.* The commands or orders of the battalion commander are given either verbally, by bugle, by signal, or by means of staff officers or orderlies who communicate the desired directions.

b. In all close-order movements, except the manual of arms or where otherwise prescribed, each company executes the necessary movements at the company commander's command of execution.

c. The battalion commander may employ, when applicable, the commands prescribed for the drill of the seaman, the squad, the platoon, and the company. Proper substitutions in designation of the units are made when necessary.

4–2. Movements.—*a.* Each company commander moves his company from one formation to another by the most convenient means and route.

b. Upon the completion of a movement ordered by the battalion commander, companies may be given **at ease** until another movement is begun, except at ceremonies.

c. All movements, except the manual of arms, are executed independently by the companies of the battalion unless otherwise directed.

d. Companies march at attention from one formation to another.

e. After the battalion is halted, its subdivisions make no movement to correct alignment, intervals, or distances, unless directed by the battalion commander.

4–3. Formations.—*a.* In forming the battalion, the companies are normally arranged from right to left or front to rear, as the case may be, in the following order: The headquarters company, the three rifle companies in alphabetical or numerical order, the machine-gun company.

b. Column of squads is the only close-order formation that has any application in campaign.

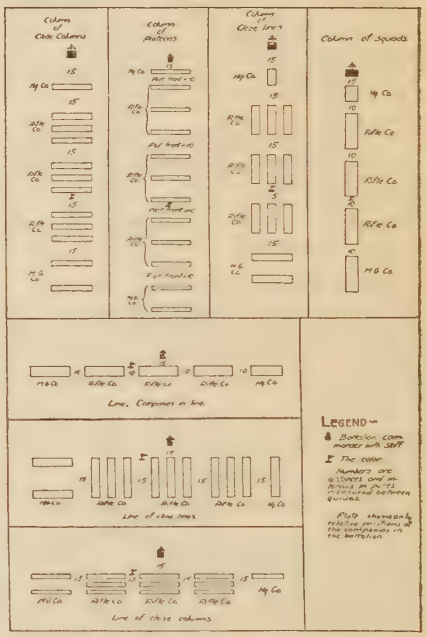


FIG. 75.—Formations of the battalion

c. To assume any formation the battalion commander indicates the character of the formation desired, the point of rest, and the direction the line or column is to face.

d. The battalion is normally formed in column of squads.

e. After the battalion has once been formed no cognizance is taken of the relative order of the companies.

f. A peace or reduced strength battalion conforms to the formations prescribed in Figure 75 as far as practicable.

4–4. The machine-gun company.—*a.* When the battalion is in close formation or in column of platoons the machine-gun company will be in close column with each platoon in close line.

b. The machine-gun company being in close column may execute **Column right** (**left**) or **Forward march**, or may form **March column** or **Column of squads.**

4–5. The band.—The band when attached to the battalion is posted by the adjutant as prescribed in paragraphs 4–12 (*e*) and 4–13 (*b*).

4–6. Attached units.—*a.* Attached units take post as directed by the battalion commander.

b. Attached units conform to the movements of the other units of the battalion.

4–7. Designation of units.—*a.* In whatever direction the battalion faces, the companies are designated numerically from right to left in line and from head to rear in column; i. e., first company, second company, third company,etc.

b. The terms right and left apply to actual right and left as the line faces; if the about by squads be executed when in line, the right company becomes, for instance, the left company.

c. The designation, center company, indicates the right center or the actual center company according as the number of companies is even or odd.

Section II.—THE BATTALION STAFF

4–8. Composition.—*a.* The battalion commander's staff consists of the second in command, the battalion adjutant, intelligence officer, plans and training officer, and supply officer.

b. For the purpose of drill the following officers are formed as a part of the staff: The communications officer, the senior medical officer, and the junior medical officer.

4–9. Formation.—*a.* Officers are arranged in order of rank from right to left with the adjutant on the extreme right.

b. The enlisted personnel form in single rank in order of rank from right to left and 3 paces in rear of the battalion staff, the right man of the rank being directly in rear of the position to be occupied by the adjutant.

4–10. Posts.—*a.* In war-strength organizations the plans and training officer is normally designated as the adjutant of the formation and takes post accordingly.

b. The battalion adjutant, who commands the headquarters company, is with his company when it is formed as a unit. In peace-strength organizations he performs the duties of all the battalion staff officers.

c. The battalion commander will supervise the formation from such positions as will best enable him to correct alignments and distances. With his staff (less the adjutant and battalion adjutant) he takes post in time to receive the report of the adjutant.

d. During route marches the supply officer, the two medical officers, the communications officer, and all enlisted personnel of the headquarters company march with their respective organizations unless otherwise directed.

4–11. Movements.—*a.* When the battalion commander desires the staff to follow him or to reduce the front of the staff, he directs the senior member to cause the staff to follow in column of twos, fours, or to form column of twos or fours.

b. The enlisted personnel, commanded by the senior petty officer, follows the staff in like formation.

Section III.—TO FORM THE BATTALION

4–12. To form in column of squads.—*a.* The company commanders will be informed of the formation to be taken, the point of rest, and the direction in which the column is to face.

b. The adjutant takes post 6 paces in front of the point to be occupied by the leading guide of the battalion so as to be facing the column when is it formed.

c. *Adjutant's call* is then sounded, or the adjutant signals **Assemble.**

d. The companies are halted, at attention, successively from the front and in their proper order and places.

e. The band takes post so that there will be 15 paces between the rear of the band and the head of the leading company when the leading company has halted

f. Attached units take their places when the rear company has halted.

g. Each company commander, when his company is in place, salutes the adjutant, who returns the salute. The former then faces toward his company and commands: **AT EASE.**

h. When the last company commander has saluted and his salute has been returned, the adjutant brings the battalion to attention, faces the battalion commander, salutes and reports: "Sir, the battalion is formed." When his salute has been acknowledged he takes his post.

4–13. To form in line of close columns.—*a.* The company commanders will be informed of the formation to be taken, the point of rest, and the direction in which the line is to face.

b. The band takes post so that its left will be 15 paces to the right of and facing in the same direction as the leading platoon of the right company of the battalion when formed.

c. The adjutant takes post so as to be 6 paces to the right of the front rank of the leading platoon of the right company when the battalion has formed, and faces in the direction in which the line is to extend.

d. *Adjutant's call* is then sounded, or the adjutant signals **Assemble.**

e. When adjutant's call has been sounded, or the adjutant has signaled the assembly, the band will play until the left company of the battalion has halted on the line.

f. The companies, arriving from the rear, each in close column, are halted on the line successively from right to left and in their proper order and places.

g. When each company arrives within 30 paces of the line it is to occupy, the company commander commands: **GUIDES LEADING PLATOON ON THE LINE.** At this command the guides of the designated platoon, without changing the position of their rifles, double time, place themselves on line with the adjutant, halt, execute order arms and face toward the adjutant.

h. The adjutant then establishes the guides in the desired direction.

i. Each company commander halts his company 1 pace in rear of the guides which have been posted as in subparagraph *g* and commands: 1. **Right,** 2. **DRESS.** Each company is then dressed.

j. After the adjutant has established the guides he verifies the alignment of all lines from corresponding positions on the right. When this has been accomplished, all units of the battalion have been dressed and officers and all others have reached their posts, the adjutant from his original position commands: 1. **Guides,** 2. **POST.**

k. The adjutant then takes post facing the battalion midway between the post of the battalion commander and the center of the battalion and commands: 1. **Present,** 2. **ARMS.** He then turns about, salutes and reports to the battalion commander, "Sir, the battalion is formed."

l. The battalion commander returns the salute and directs the adjutant: "Take your post, sir," and brings the battalion to the order.

m. The adjutant takes his post by passing to the battalion commander's right.

4–14. To form line.—*a.* When the battalion is at peace or reduced strength, the principles of paragraph 4–13 apply and the formation will be as shown in Figure 75 (companies in line).

b. The companies march in line to their respective places as prescribed above for the leading platoon except that each company commander commands: **GUIDES ON THE LINE** as his company arrives within 30 paces of its place in line.

4–15. To dismiss the battalion.—*a.* To dismiss the battalion the battalion commander commands: **DISMISS YOUR COMPANIES.**

b. Each company commander salutes the battalion commander and marches his company off and dismisses it.

c. The battalion commander's command to dismiss the companies will be the signal for the staff and its enlisted personnel to fall out.

Section IV.—THE REGIMENT

4–16. Scope.—The regiment does not engage in prescribed drills. It may be drilled, however, in forming for ceremones, street parades, or marches.

4–17. Formations.—The formations of the regiment (fig. 76) are—

a. Line of battalions in line of close columns.
b. Line of battalions in line of close lines.
c. Line of battalions in column of close columns.
d. Line of battalions in column of close lines.
e. Column of squads.
f. Column of battalions in line of close columns.
g. Column of battalions in line of close lines.
h. Column of battalions in column of close columns.
i. Column of battalions in column of close lines.

4–18. Use of formations.—Column of squads is the usual column of march. Column of battalions in column of close columns and column of battalions in column of close lines are formations suitable for street parades and for marching in review. The other formations shown in Figure 76 are suitable for ceremonies and inspections.

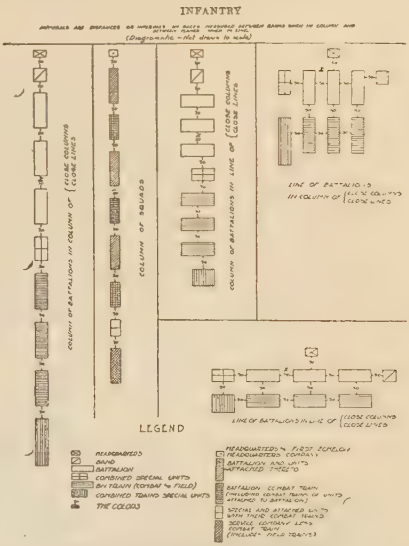


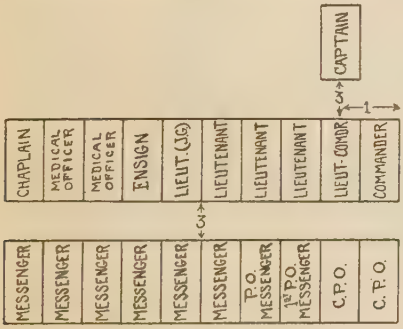
FIG. 76.—Formation of the regiment

4–19. Rules for formations.—*a.* In whatever formation the regiment may be, the battalions retain their permanent administrative designations: First, second, and third battalions. For convenience they may be designated, when in line, as right, center, or left battalion; when in column, as leading, center, or rear battalion. These designations apply to the actual positions of the battalions in line or column.

b. For all formations of the regiment, except column of squads, the headquarters company (less the commander of the communications platoon and all mounted enlisted men), the howitzer company, the service company (less the band, the mounted officers and enlisted men of the headquarters platoon, and the transportation platoon), and the attached medical personnel (less those mounted) are combined under command of the machine-gun officer. The combined special units conform to the formations and movements of the battalions and are formed in the following order from right to left, when in line, and from front to rear, when in column: Headquarters company, howitzer company, attached medical personnel, service company.

c. When the regiment is in line, the battalion trains (battalion sections of the transportation platoon, service company) are formed in rear of their respective battalions; when in column, they are formed in rear of the combined special units and in the same order from front to rear as their respective battalions.

d. When the regiment is in line, the combined trains of the special units are formed in rear of the combined special units; when in column, except column of squads, they are formed in rear of the battalion trains.



NUMERALS ARE PACES.
OFFICERS ARE ARRANGED IN ORDER FROM RIGHT TO LEFT ACCORDING TO RANK.

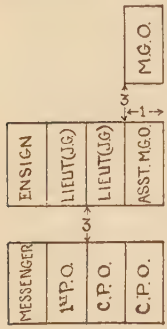
FIG. 77

e. When battalions are in line, trains are formed in line; when in column, except in column of squads, trains are formed in column. When troops are in column of squads, trains are in single column.

f. When the regiment is in column of squads, unless otherwise directed, battalion and special unit combat trains follow their respective battalions or units, and the combat trains of units attached to battalions join the corresponding battalion combat trains.

g. For all formations except column of squads, the regimental commander's staff is augmented by the following: Two medical officers, one chaplain, one lieutenant (commanding communications platoon, headquarters company), one c. p. o. (headquarters company), and the following men of the communications platoon, headquarters company: one c. p. o., one 1. p. o. (messenger), one p. o. (messenger), six seamen (messengers). Their positions with reference to the regimental commander are as shown in Figure 77.

h. When the special units are combined, the following officers and enlisted men form the staff of the machine-gun officer: Assistant machine-gun officer, two lieutenants (junior grade), and one ensign (supply section, headquarters platoon, service company), two c. p. o's. and one 1. p. o. (supply section, headquarters platoon, service company), and one seaman (messenger, communications platoon, headquarters company). Their positions with reference to the machine-gun officer are as shown in Figure 78.



NUMERALS ARE PACES.
LIEUTENANTS(JG) AND CPO's ARRANGED FROM RIGHT TO LEFT ACCORDING TO RANK.

FIG. 78

i. When the regiment forms in column of squads, the medical officers join the regimental commander's staff and the attached chaplain joins the service company, unless otherwise directed.

j. In all formations of the regiment, except in column of squads, the colors are with the center battalion; when in column of squads the colors are with the service company, unless otherwise ordered.

4–20. To form the regiment.—*a.* To assume any formation, except column of squads, the regimental commander prescribes the formation, the hour of forming, the direction in which the regiment will face, the order of battalions from right to left, in line, or from front to rear, in column, and the point of rest.

b. To form the regiment in column of squads, the regimental commander prescribes the formation, the place where the regiment is to form (usually on a road), the direction in which the regiment will face, the hour of forming, the initial point (location of head of column), and the order in column of the headquarters, battalions, special and attached units, and field trains.

c. The regimental commander gives his orders either verbally or in writing, to form the regiment; they may be given directly to the officers concerned or may be communicated to them through staff officers or messengers.

d. Before forming the regiment, the regimental commander may cause the positions, which are to be taken by the larger element to be indicated by markers.

e. Battalion commanders and commanders of special and attached units move their commands by the most suitable means and routes to the place of formation and dispose them as ordered.

f. Upon arrival at their designated places in the prescribed formation, battalion and special unit commanders report the fact to the regimental commander; if the special units are combined, the commander thereof reports the arrival of the combined special units at their designated place.

g. Battalions and special units stand at rest upon arrival at their designated places, unless otherwise directed.

4–21. To march.—*a.* The regiment being in any formation, the regimental commander prescribes the formation in which the regiment will march and the route to be followed, and puts the command in motion by prescribing the hour or by giving the command: 1. **Forward**, 2. **MARCH**, or by bugle or signal.

b. If the regiment is in column of squads, the formation in which it will march may be omitted.

c. To march in route column, the regiment is not ordinarily formed and put into march as a unit. Battalion commanders and special and attached unit commanders are usually informed in orders of the destination, route, hour of starting, initial point, order of march, and, if necessary, the distances between elements, and are held responsible for having their commands take their places in the column at the prescribed time and place.

4–22. To halt.—To halt the regiment, the regimental commander may either prescribe the hour when the column will be halted or he may give the command or signal **HALT.**

4–23. To dismiss the regiment.—To dismiss the regiment, the regimental commander orders the battalion and special and attached unit commanders to dismiss their organizations. The order may be given directly to the commanders concerned or it may be communicated to them through staff officers ormessengers.

Section V.—THE BRIGADE

4–24. Drill.—The brigade does not drill.

4–25. Formations.—There are no prescribed formations for the brigade.

4–26. To form the brigade.—*a.* To assume any formation the brigade commander issues verbal or written orders in which he prescribes the formation

and the method of forming. When necessary, such orders are accompanied by march tables.

b. To form the brigade in route column, unit commanders are informed of the destination, the route, the hour of starting, the initial point, the order of march, and, if necessary, the distances between elements. The unit commanders will be responsible for having their commands in readiness to take their places in the column at the prescribed time and place.

c. For formations other than in route column, the brigade commander ordinarily causes the positions of the larger elements to be indicated by markers on the ground where the brigade is to form.

4–27. To march.—*a.* If the brigade is in route column, the brigade commander puts it in march by prescribing the hour of starting.

b. If the brigade is in any formation other than in route column, the brigade commander indicates in orders the formation in which it will march and puts it in march by command, by signal, or by prescribing the hour of starting.

4–28. To halt.—*a.* To halt the brigade at any time except hourly, the brigade commander issues the necessary orders or halts the leading unit by command or signal.

b. To halt the brigade for hourly halts, the brigade commander prescribes, in his march order, when and for how long such halts will be made.

4–29. To dismiss the brigade.—To dismiss the brigade, the brigade commander issues the necessary orders.

Section VI.—DRILL, THE HEADQUARTERS COMPANIES, INFANTRY BATTALION, REGIMENT, AND BRIGADE

4–30. In all operations ashore there are certain necessary small details such as staff sections, intelligence, messengers, communications, pioneers, transportation, cooks, etc., which are gathered into a unit known as the headquarters company. In minor operations of the Navy ashore these units may consist of a small detail under a competent officer, but in major operations, the company status should be adhered to.

Before the adoption of the headquarters company as a unit, much confusion resulted from taking men from combatant groups, either temporarily or permanently for special details and for this reason an organization of a permanent character was adopted.[1]

4–31. Responsibility for training.—*a.* The company commander is responsible for the general training of the company and for the supervision of special training.

b. The responsibility for the special training of each platoon and section is normally placed upon the officer under whom the platoon or section functions in time of combat.

4–32. How trained.—The company will be trained in close order drill.

4–33. Administration.—The administration of the interior economy of the company is based upon the platoon and section organization as shown in the tables of organization.

4–34. Kinds of formations.—The formations employed by the company are as follows:

a. In general, all formations used by the rifle company in so far as they are applicable to a company of this size and type.

b. The following special formations are employed:

(1) Assembly.
(2) Drill.
(3) Route march.
(4) Inspection.

4–35. Use of formations.—*a.* The assembly formation is generally used for reveille, retreat, and roll call. It is the one habitually to be used on the company parade.

b. The drill formation is used for close-order drill and in preparation for ceremonies.

c. The inspection formation is used for careful check of the personnel and for thorough and detailed inspection of equipment.

d. The company maneuvers in accordance with the Landing-Force Manual which prescribes the drill of various infantry units.

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[1] See Part III, Combat Principles—TR 420–110; Rifle Section, par. 1, TR 420–115; Rifle Platoon, par. 1; and TR 420–120, Rifle Company, par. 2.

4–36. Inspection.—The company, in any of the special formations, is inspected in a manner similar to that of the rifle company.

For a more detailed and accurate inspection of the personnel and equipment the special formation as hereinafter prescribed may be used. (See par. 4–43.)

4–37. Forming the company.—*Rapidity.*—Companies will have established formations for drill and will be trained in quickly taking these formations from the assembly formations. In emergencies, where time is lacking, companies will take the drill formations. In such event assembly and roll call will be omitted.

4–38. Positions.—In forming for drill or for ceremonies the platoons may, for the sake of uniformity and appearance, be formed as follows:

a. Each with the same number of squads.

b. Men equipped with the rifle may be placed in one platoon. If there are too many for one platoon they may form in the front rank of another.

4–39. Size.—For formations other than assembly a platoon having less than three squads will be broken up and its personnel distributed among the other platoons; a company composed of less than six squads will be formed as one platoon.

In the regimental and brigade headquarters companies it may be found advisable, because of the few men present in company headquarters, to organize the company into two platoons. The communications platoon, intact, may then remain as the second platoon and the remainder of the men present be formed as the first platoon. The battalion headquarters company may similarly be consolidated into one platoon.

4–40. Throughout these regulations, in changing from assembly formation to drill or route march formation, the second preparatory command is often expressed as: 2. (Describes formation desired). Such indication means that the company commander may give instructions for effecting any modification of the company's established formation. Such changes may be made necessary by the marked increase or decrease of personnel present or by orders from higher authority. In these instructions the company commander may state the following:

(1) Number of platoons.

(2) Commander of each platoon.

(3) What personnel will compose each platoon.

(4) What personnel is to report to the battalion commander.

(5) Line on which company will reform.

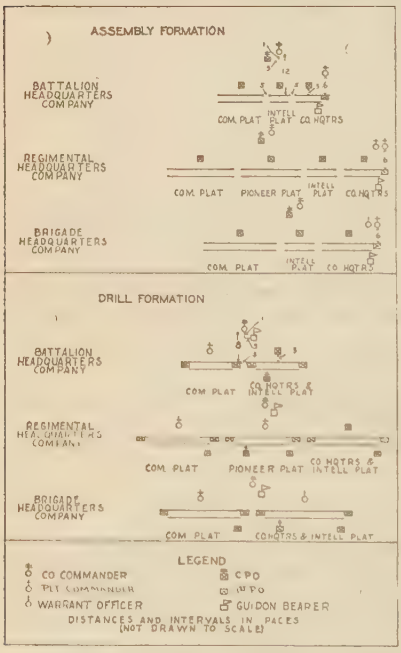

FIG. 79.—Assembly and drill formation

Formations

4–41. Assembly formation.—*a.* The assembly formation consists of formation in line.

b. At assembly formation the elements of the company are arranged from right to left as shown in Figure 79. The platoons are formed as directed by the company commander. The communications platoon normally forms from right to left in the following order: Message center; visual section; radio and panel section; wire section; messenger section. The integrity of sections is maintained in so far as a formation by squads will permit.

c. The headquarters company does not drill while in assembly formation.

d. (1) To form the company in assembly formation, the c. p. o. takes position 6 paces in front of the point where the center of the company is to be, faces it and commands: **FALL IN.** The right guide places himself, facing to the front, so that the center of the company will be opposite to and 6 paces from the c. p. o. Platoons form in their proper places under supervision

of the platoon p. os., who take post 3 paces in front of the point where the center of their platoons will be.

(2) The platoon p. os. then command: **REPORT.** Remaining in position at the order, the squad leaders, in succession from the right, in each platoon, report: "All present," or "——— absent." The platoon p. os. then command: 1. **Inspection**, 2. **Arms**, 3. **Order**, 4. **Arms**, face about, and at the command **REPORT**, given by the c. p. o., they report successively, beginning with company headquarters: "All present or accounted for," or "—— men absent." The c. p. o. then faces about and reports: "Sir, all present or accounted for," or "Sir, —— men absent," and without command takes his post.

(3) The company commander places himself 12 paces in front of and facing the company in time to receive the report of the c. p. o.

(4) The other officers take their posts when the c. p. o. has reported.

(5) The company not under arms is formed in like manner, but with omission of reference to arms.

(6) In forming the company all who are required to make a report salute, and maintain it until the report is acknowledged.

4–42. To change to drill formation.—*a.* To form the company for drill or ceremonies from assembly formations the company commander directs the c. p. o. to form the company for drill. The c. p. o. moves to a position six paces in front of the center of the company, faces it, and commands: 1. **Form for drill**, 2. (Describes formation desired), 3. **MARCH.** Officers fall out. Platoon p. os. supervise the formation of their platoons. At the command **POSTS**, given by the c. p. o. when the formation is completed, they take posts. The c. p. o. then faces about and reports: "Sir, the company is formed," and takes his post.

b. The platoon leaders take their posts when the c. p. o. has reported.

4–43. To change to inspection formation.—The company being in assembly formation, and having arrived near the ground selected for the inspection, forms for inspection as follows: The company commander establishes the senior petty officer of company headquarters at the point where he wishes the right of the formation to rest, and causes him to face in the direction the company is to be faced for inspection. He then takes post 4 paces in front of the petty officer so posted, faces to the rear and commands: **FORM FOR INSPECTION.**

a. At this command the next senior petty officer of company headquarters marches the company headquarters and halts it 4 paces in rear of the senior petty officer. He then commands: 1. **Form for inspection.** 2. **MARCH.** At the command **March** the men of company headquarters move forward and place themselves in single rank on line with, and to the left of, the senior petty officer. All dress to the right. The senior petty officer aligns company headquarters and commands: 1. **Front**, 2. **AT EASE.**

b. Each remaining section then forms in a similar manner in rear of the company headquarters with a distance of 4 paces and in the following order: Staff section, intelligence section, pioneer platoon, communications platoon headquarters, message center, visual section, radio and panel section, wire section, messenger section, and transportation section. If a given element such as the pioneer platoon occupies an excessive frontage it may be divided into two sections, the second being formed 4 paces in rear of the first. Each section is marched by its senior petty officer present or its officer to a point 4 paces in rear of where it is to form. The senior takes post, faces to the left, and commands: 1. **Form for inspection**, 2. **MARCH.** He then faces to the front. Men of the section execute the movement as prescribed for company headquarters. The section is properly aligned by its senior, who then commands: **AT EASE.**

c. The company commander from his position requires the chiefs of each section to cover in file. When the movement is completed the company commander commands **REST.**

d. The inspection then proceeds in a manner similar to that prescribed for the rifle company.

e. The company may be dismissed by section or platoon after the inspection of each is completed, if so directed by the inspecting officer; or the entire company can be reformed in any desired formation by establishing a right guide and giving the commands for the formation.

Chapter 5

CEREMONIES AND INSPECTIONS

Section I.—GENERAL RULES, CEREMONIES

5–1. Arrangement of units in formation.—*a.* The order in which troops are arranged for ceremonies is prescribed in Navy Regulations. A peace or reduced strength company in line is formed with the men arranged according to height from right to left, the tallest on the right. In a war strength company the men in each platoon will be similarly arranged according to height.

b. The commanding officer of unit concerned and his staff will actively supervise formations for all ceremonies. They will move to such positions as will best enable them to make corrections.

5–2. Staff salutes.—At the command **Present arms** given by the commanding officer of the troops, his staff salutes; the battalion commander's staff salutes at the battalion commander's command of present arms; and other staffs salute with their commanders.

5–3. Place of formation.—*a.* At the **assembly** for a ceremony, companies are formed on their own parades and inspected.

b. At *adjutant's call*, except for ceremonies involving a single battalion, each battalion will be formed on its own parade, reports received, and the battalion presented to the battalion commander. At the second sounding of *adjutant's call*, the regiment is formed.

5–4. Modification of formations.—Formations for ceremonies may be modified by commanding officers when the nature of the ground or exceptional circumstances require such changes to be made.

5–5. Size of units.—*a.* When participating in a ceremony it is desirable that all platoons contain the same number of squads. When companies are at peace or reduced strength, the battalion may be formed in line, the rifle companies being in line and the machine-gun company in close line. If necessary the rifle companies may be formed without a division into platoons, the machine-gun company consisting of but one platoon.

b. Members of company headquarters detachments will, whenever possible, be posted in the line of file closers, formed as an extra squad of a platoon, or used to fill blank files.

Section II.—REVIEWS

5–6. General rules.—*a.* (1) The adjutant causes markers to be placed or otherwise indicates the line of march of the column in such manner that its flank in passing will be about 20 paces from the reviewing officer.

(2) The post of the reviewing officer is indicated by a marker.

(3) Officers of the same grade as the reviewing officer or of higher grade, and distinguished personages invited to accompany him, place themselves on his eft or as otherwise indicated; their staffs and orderlies place themselves on the corresponding side of the staff and orderlies of the reviewing officer; and all others who accompany the reviewing officer place themselves on the left of his staff or as otherwise indicated, their orderlies on the left of the line of orderlies. An officer, preferably a member of the staff, is designated to escort distinguished personages and to indicate to them their proper positions.

b. (1) While passing around the troops the reviewing officer may direct that his staff, flag, and orderlies remain at the post of the reviewing officer, or that only his personal staff and flag accompany him. In either case the commanding officer alone moves abreast with the reviewing officer. While passing around the troops the commanding officer is on that side of the reviewing officer which is away from the command. If the reviewing officer is accompanied by his staff, the staff officers of the commander place themselves on the side of the staff of the reviewing officer corresponding to the position of the commander.

(2) The reviewing officer makes such general inspection of the command as he may desire while passing around the troops. A detailed and methodical inspection is not part of the ceremony of review.

(3) The reviewing officer and others at the reviewing stand salute the color as it passes. When passing around the troops, the reviewing officer and those accompanying him salute the color when passing in front of it.

(4) The reviewing officer returns only the salute of the commanding officer of the troops. Those who accompany the reviewing officer do not salute.

c. In passing in review, each staff salutes with its commander.

d. After saluting the reviewing officer in passing in review, the commanding officer of the troops turns out of the column and takes post on the side of the reviewing officer toward the direction of march of the command, and returns sword. The members of his staff accompanying him take post on the corresponding side of the reviewing officer's staff and return swords. When the rear element of his command has passed, the commanding officer of the troops, without changing his position, salutes the reviewing officer and draws sword. The members of his staff draw swords at the same time. He and the members of his staff accompanying him then rejoin the command. The commanding officer of the troops and the members of his staff are the only ones who turn out of the column and take post at the side of the reviewing officer.

e. If the person reviewing the command is not mounted, the commanding officer and his staff, on turning out of the column after passing the reviewing officer, dismount preparatory to taking post. In such case the salute of the commanding officer, prior to rejoining his command, is made with the hand before remounting.

f. When the rank of the reviewing officer entitles him to the honor, each regimental color salutes at the command **Present arms**, given or repeated by the battalion commander of the battalion with which it is posted; and again in passing in review (see par. 6–3). During the first salute the band and field music play as prescribed in Navy Regulations. During the second salute only the prescribed ruffles and flourishes will be played.

g. (1) The band of an organization plays while the reviewing officer is passing around the organization.

(2) During the march in review each band turns out of the column, takes post as hereinafter prescribed or as otherwise directed and continues to play until the regiment has passed. It then ceases playing and follows in rear of its regiment. The band of the following regiment commences to play as soon as the preceding band has ceased.

(3) In large commands bands may be massed and posted as directed by the commanding officer.

h. The present arms by the troops, and passing around the troops by the reviewing officer may be dispensed with.

i. Troops march in review with the guide toward the flank on which the reviewing officer is posted.

j. Troops pass in review in quick time only.

k. (1) In reviews of regiments or larger units care must be exercised by each organization commander that the step be maintained in his unit after it has passed the reviewing officer in order not to interfere with the march of the column in rear. If abnormal terrain or other adverse conditions make it necessary, the commanding officer may direct each battalion and special unit, after its rear has passed the reviewing officer 50 paces, to take the double time for 100 yards.

(2) When the review is to be followed by an inspection, units after passing in review reform in their original places or as otherwise directed.

l. In a brigade or larger review a regimental commander may cause his regiment to stand at ease, rest, or stack arms and fall out, and resume attention, provided it will not interfere with the ceremony.

m. When an organization is to be reviewed before an inspecting officer junior in rank to the commanding officer, the commanding officer receives the review and is accompanied by the inspecting officer, who takes post on his left.

5–7. **Battalion review.**—*a.* (1) The battalion having been formed in line of close columns or in line, the battalion commander faces to the front. The reviewing officer moves a few paces toward the battalion commander and halts. The battalion commander turns about and commands: 1. **Present**, 2. **ARMS**, and again turns about and salutes.

(2) The reviewing officer returns the salute. The battalion commander turns about, brings the battalion to order arms, and again turns to the front.

(3) The reviewing officer moves toward the battalion commander and halts about 6 paces from him. The battalion commander salutes, joins the reviewing officer, and accompanies him around the battalion. The band plays while they are passing around the battalion. The reviewing officer proceeds to the right

of the band and thence to the left of the line by passing immediately in front of the company commanders. He then proceeds around the flank and passes in rear of the battalion and the band.

(4) On arriving again at the right of the band, the battalion commander salutes and halts, and the reviewing officer with his staff proceeds to his post in front of the center of the battalion. When the reviewing officer and his staff have passed him, the battalion commander moves directly to his post in front of the battalion, faces it, and commands: **PASS IN REVIEW.**

(5) At the command **Pass in review** the band changes direction, if necessary, and halts.

(6) (*a*) *The battalion being in line* (*rifle companies in line and the machine-gun company in close line*).—When the band has halted, the battalion commander commands: 1. **Squads right**, 2. **MARCH.** At the command **March** the band, playing, and the battalion moves off, the rifle companies forming column of squads to the right; the machine-gun company executing platoons right turn and then moving to the right oblique until the left guides of its platoons cover the guides of the rifle companies.

(*b*) *The battalion being in line of close columns* (*rifle companies in close column and the machine-gun company in close column*).—When the band has halted, the commander of the right company commands: 1. **Column of squads**, 2. **Leading platoon, squads right**, 3. **MARCH.** At the command **March** the band, playing, and the leading platoon move off. The other platoons of the right company move forward in time to execute squads right on the same ground as the leading platoon and follow the preceding platoon in column of squads at the proper distance and without command from the battalion commander. The other rifle companies successively form column of squads to the right in the same manner and in time to follow the preceding company at 10 paces. The machine-gun company executes column right and then right oblique until the left guides of its platoons cover the guides of the rifle companies.

(7) The band and the battalion change direction at the points indicated without command from the battalion commander. At the first change of direction the machine-gun company executes column left at such time as will permit the right guides of its platoons to cover the right flank of the column. At the second change of direction each rifle company commander in turn commands: 1. **Column of platoons**, 2. **Leading platoon, squads left**, 3. **MARCH.** The machine-gun company executes column left at such time as will permit the right guides of its platoons to cover the right guides of preceding platoons. It will pass in review in close column.

(8) The battalion commander takes post 15 paces in front of the band immediately after the second change of direction.

(9) The battalion commander and staff salute when the former is 6 paces from the front of the reviewing officer and terminate the salute when the battalion commander has passed 6 paces beyond him. The band executes column left when it has passed the reviewing officer. When the rear of the band is 10 paces beyond the left flank of the marching column, it executes a second column left. A third column left is given at such time as to place the band in front of and facing the reviewing officer and 10 paces from the left flank of the troops.

(10) Each company commander and the second in command execute and terminate the salute in the same manner and when in the same relative positions with respect to the reviewing officer as prescribed for the battalion commander and his staff. Each platoon leader, without turning his body, commands: 1. **Eyes**, 2. **RIGHT**, 3. **FRONT.** He gives the command **Right** when he is 6 paces from the front of the reviewing officer, and the command **Front** when the rear element of his platoon has passed beyond the reviewing officer. He brings his sword to the first position of present sword at the command **Eyes** and to the second position at the command **Right.** He resumes the carry at the command **Front.**

(11) The commands **Eyes right** and **Front** will be given by machine-gun company and platoon commanders as prescribed for the rifle company.

(12) Warrant officers, staff petty officers, and the drum major execute and terminate the salute at the points prescribed for the battalion commander. In each platoon the right guide, the man on the right in the rear rank, and the man on the right in the line of file closers do not execute **Eyes right.** Men in the line of file closers do not salute in passing in review.

(13) If the reviewing officer is entitled to a color salute, the regimental color salutes when at 6 paces from his front and is raised when at 6 paces beyond him.

(14) Having saluted, the battalion commander and his staff take post and proceed as prescribed in paragraph 5–6 (*d*).

(15) The review terminates when the rear unit has passed the reviewing officer. The band then ceases to play and, unless otherwise directed by the battalion commander, returns to the position it occupied before passing in review, or is dismissed. The battalion then executes such movements as the reviewing officer may have directed, or marches to its parade ground to be dismissed.

b. At battalion review the battalion commander and his staff may, in the discretion of the commanding officer, be dismounted.

5–8. Regimental review.—*a.* (1) The regiment ordinarily is formed in line of battalions in column of close columns, or in case of companies at peace or reduced strength, when not divided into platoons, in line each battalion being in close column.

(2) The review proceeds as prescribed for the battalion, except that "regimental commander" is substituted for "battalion commander" and "regiment" for "battalion."

(3) At the regimental commander's command **Present Arms**, the battalion commander of the center battalion commands: 1. **Present**, 2. **ARMS.** The other battalion commanders, successively from the center, bring their battalions to present arms. **Order arms** is similarly executed.

(4) To march the regiment in review, the regimental commander commands, orders, or signals: **Pass in review.** At this command the band changes direction, if necessary, and halts.

(5) (*a*) When the regiment is formed in line of battalions in column of close columns, and the band has halted, the battalion commander of the right battalion commands: 1. **Column of close lines**, 2. **First company, squads right**, 3. **MARCH.** At the command **March**, the band and the leading company of the right battalion move off, the band playing. The other companies of the right battalion move forward successively in time to execute squads right (column right for the machine-gun company) on the same ground as the leading company, and follow the preceding company at 15 paces. Other battalion commanders, successively from the right, move their battalions by the same commands and in a similar manner in time to follow the preceding battalion at 30 paces. The band and companies change direction without command from the battalion commanders and pass in review in close column. At the first change of direction rifle companies execute **squads left** and at the second change **column left.** The machine-gun company executes column left at each change of direction.

(b) When the regiment is formed in line of battalions, each battalion in close column, companies being at peace or reduced strength and not divided into platoons, and the band has halted, the battalion commander of the right battalion commands: 1. **Column of squads**, 2. **First company, squads right**, 3. **MARCH.** At the command **March**, the band and the leading company of the right battalion move off, the band playing. The other rifle companies of the right battalion move forward successively in time to execute squads right on the same ground as the leading company and follow the preceding company at 5 paces. The machine-gun company moves forward and executes right turn in time to follow the preceding company at a distance of machine-gun company front and 5 paces, and so that the left guide will cover the guides of the rifle companies. Other battalion commanders, successively from the right, move their battalions by the same command and in a similar manner in time to follow the preceding battalion at 30 paces. The band and companies change direction without command from the battalion commanders and pass in review in column of companies. At the first change of direction each battalion executes **column left**, the machine-gun company changing direction at such time as will permit the right guide to cover the right flank of the column, and at the second change each battalion forms column of companies.

(6) At the second change of direction each battalion commander takes post 15 paces in front of his leading company. The regimental commander takes post 30 paces in front of the band immediately after the second change of direction.

(7) The march of the combined special units is conducted similarly to that of a battalion.

(8) The commands **Eyes right** and **Front** are given as prescribed for battalion review.

(9) The rear of the column having passed the reviewing officer, the battalions and special units ordinarily are marched to their parades and dismissed.

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b. The review of a small body of troops composed of different arms is conducted on the principles laid down for the regiment. The troops of each arm are formed and marched so as to conform to the movement of the infantry.

5–9. **Reviews of brigades or larger units.**—*a.* The principles of regimental review are observed for larger units.

b. A command, consisting of one regiment or less and detachments of other arms, is formed for review as ordered by the commanding officer.

c. (1) In the review of a brigade or larger command, regiments are formed as prescribed for the regiment. Trains and other organizations are similarly formed. The arrangement of the regiments and brigades is made as prescribed by the commander.

(2) The basic units of movement are the infantry battalion and the field artillery battery.

d. The reviewing officer takes post opposite the center of the command. The commanding officer of the troops commands: 1. **Present**, 2. **ARMS.** Battalion and other units are presented and brought to the order successively from the center as prescribed for the regimental review. Only the commanding officer of the troops and battalion commanders give the command **Present arms.** Brigade and regimental commanders and their staffs salute as soon as their last battalions have presented.

e. (1) The reviewing officer receives the present in front of the center of the command. After passing around the command, he takes post at a convenient distance in front and to the right of the right flank. The commanding officer of the troops then commands, orders, or signals: **Pass in review.** The movement is initiated by the right regiment as prescribed for the regiment. At the command **Pass in review**, the band changes direction to the right and halts. The battalion commander of the right battalion commands: 1. **Column right**, 2. **MARCH.** At the command **March** the battalion, in column of close columns with guide left and preceded by the band, moves off to the right, the band playing. The band turns to the left out of column when 50 to 100 paces beyond the reviewing officer, and moves a sufficient distance in the new direction to countermarch and halt on the line with him. The other battalions of the right regiment move successively to the right in like manner, in time to follow the preceding battalion, in column of close columns at 30 paces. The right battalion of each succeeding regiment moves to the right in time to follow the preceding unit at 60 paces. The distance between brigades is 90 paces.

(2) **Eyes left** is executed similarly to the method of executing **Eyes right** as prescribed for the regiment.

(3) The foregoing formation may be modified to conform to available terrain.

(4) The command may pass in review toward either flank or to the front of either flank when required by the condition of the ground.

Section III.—PARADES

5–10. **General rules.**—*a.* If dismounted, the officer receiving the parade and his staff stand at parade rest with arms folded and raised so that the upper arms are horizontal while the band is sounding off. They resume attention with the adjutant. If mounted, they remain at attention.

b. At the command **REPORT**, given by a battalion adjutant, the company commanders in succession from the right salute and report "A (or other) company, present or accounted for"; or "A (or other) company, (so many) officers or men absent." The adjutant returns each company commander's salute after the report is made and understood. He returns to the carry after acknowledging each salute.

c. Machine-gun companies and the howitzer company are ordinarily formed dismounted and without carts, their formations, commands, and movements conforming to those of the rifle companies. If formed mounted and with carts, their commanders dismount to execute **Officers center** at battalion parades.

5–11. **Battalion parade.**—*a.* At *adjutant's call*, the battalion is formed in line of close columns or line but not presented. The battalion commander takes post at a convenient distance in front of the center of and facing the battalion.

b. The adjutant, from his post in front of the center of the battalion, commands: 1. **Parade**, 2. **REST.** After the battalion has executed **Parade rest** he then commands: **SOUND OFF.**

c. The band in place, plays the "sound off" of three chords, giving two beats in quick time to each chord, and at the conclusion of the third chord moves for-

ward playing in quick time. It executes column left so as to march across the front of the battalion midway between the adjutant and the line of company commanders. When the band has passed the left of the line it countermarches and returns over the same ground to the right of the line. After it passes beyond the right of the battalion it executes column right. When the entire band has passed beyond the front rank of the battalion it again countermarches and halts in its original position. When the band ceases playing, the "sound off" is again played. At evening parade, when the band ceases playing, *retreat* is sounded by the field music. Following the last note and while the flag is being lowered, the band plays *The National Anthem.*

d. Just before the last note of retreat, the adjutant comes to attention and at the ending of the last note commands: 1. **Battalion**, 2. **ATTENTION**, 3. **Present**, 4. **ARMS**. The adjutant then salutes. The battalion remains at **present arms** during the playing of *The National Anthem.* The adjutant then turns about, salutes, and reports "Sir, the parade is formed." The battalion commander directs the adjutant "Take your post, Sir," and draws sword. The adjutant moves at a trot (in quick time if dismounted), passes by the battalion commander's right, and takes his post.

e. The battalion commander then commands: 1. **Order**, 2. **ARMS**, and gives such movements in the manual of arms as he may desire. Officers, petty officers commanding platoons, the color guard, and guidon bearers having once executed the order, remain in that position during the movements of the manual.

f. The battalion commander then directs the adjutant "Receive the reports, Sir." The adjutant, passing by the battalion commander's right, advances at a trot (in quick time if dismounted) toward the center of the battalion, halts midway between it and the battalion commander and commands: **REPORT.**

g. The reports are then made as prescribed in paragraph 5–10 (*b*).

h. The reports received, the adjutant turns about, and reports "Sir, all present or accounted for"; or "Sir, (so many) officers or men absent," including among the absentees those from the band and field music reported to him by the band leader prior to the parade.

i. The batallion commander directs "Publish the orders, Sir." The adjutant turns about, and commands: **ATTENTION TO ORDERS.** He publishes the orders and then commands: 1. **Officers**, 2. **CENTER**, 3. **MARCH**. After giving the command **March**, the adjutant turns about and takes his post.

j. At the command **Center**, company commanders face to the center. At the command **March**, they close to the center, the band playing, halt, and individually face to the front.

k. The company commanders, having closed and faced to the front, the senior commands: 1. **Forward**, 2. **MARCH**. The company commanders advance, the center officer being the guide, and march on the battalion commander. The company commanders are halted 6 paces from the battalion commander by the senior, who commands: 1. **Officers**, 2. **HALT**. They halt and salute. The battalion commander returns the salute, then gives such instructions as he deems necessary, and commands: 1. **Officers**, 2. **POST**, 3. **MARCH.**

l. At the command **Post**, company commanders face about.

m. At the command **March**, they step off with the guide as before. The senior commands: 1. **Officers**, 2. **HALT**, so as to halt them 8 paces from the line; he then commands: 1. **Post**, 2. **MARCH.**

n. At the command **Post**, company commanders face outward, and at the command **March**, step off in succession at 4-pace distance, and resume their posts.

o. The music ceases when the last company commander has resumed his post.

p. The battalion commander then gives the commands for the battalion to pass in review and returns sword.

q. The battalion marches according to the commands and principles of review. When the last company has passed, the ceremony is concluded.

r. The band continues to play while the companies are in march upon the parade ground. After passing in review, companies are marched to their respective parades and dismissed.

s. When the company commanders have saluted the battalion commander, as explained in subparagraph *k*, he may direct them to form line with his staff, in which case they move individually to the front, passing to the right and left of the battalion commander, place themselves on the left of the line established by the staff and stand at attention. The music ceases when the company commanders join the staff. When the company commanders take post on line with

the staff the second in command of each company immediately assumes command. The battalion commander then causes the companies as heretofore prescribed to pass in review.

5-12. Regimental parade.—*a.* The regiment is ordinarily formed in line of battalions in column of close columns.

b. The parade proceeds as for the battalion with the following exceptions:

(1) "Regimental commander" is substituted for "battalion commander," and "regiment" for "battalion" in the description, and "battalions" for "battalion" in the commands.

(2) In moving across the front of the regiment the band passes midway between the adjutant and the line of battalion commanders.

(3) The battalions execute **present arms, order arms, parade rest,** and come to **attention** at the command of execution of their respective commanders, successively, from the center battalion.

(4) After making his report, the adjutant commands: 1. **Officers, center,** 2. **MARCH.**

(5) The battalion commanders form one line, closing on the center. The senior commands: 1. **Forward,** 2. **MARCH.** The center battalion commander is the guide and marches on the regimental commander.

(6) Battalion staff officers remain at their posts.

(7) After being dismissed, each battalion commander moves individually to the front, turns outward and proceeds at a trot toward his battalion by the most direct route and resumes his post. If dismounted, they face about at the command **Post,** and at the command **March** proceed to their posts in quick time and by the most direct route.

(8) To march the regiment in review the regimental commander commands, orders, or signals: **Pass in review.** The regiment marches according to the principles of review.

Section IV.—PRESENTATION OF DECORATIONS

5-13. Presentation of decorations.—*a.* A review is ordinarily held on occasions of the presentation of the *Medal of honor,* the *Distinguished-service medal,* the *Navy cross,* or the decoration of the colors.

b. After the reviewing officer has passed around the line and resumed his post, the commanding officer of the troops from his post commands, orders, or signals: 1. **Persons to be decorated and all colors, center,** 2. **MARCH.** At the command **March,** persons to be decorated and all colors move by the most direct route and take post as follows:

(1) The persons to be decorated in single rank in the center of the command and 10 paces in front of the line of company commanders in groups according to rank of decorations; within each group according to rank of individuals, highest ranking decoration and individual on the right, respectively.

(2) Colors to be decorated in single rank 5 paces in front of the center of the line of persons to be decorated in groups according to rank of decoration to be bestowed, highest ranking decoration on the right.

(3) All other colors with color guards in single rank 5 paces in rear of the center of the persons to be decorated and in the same relative position as their location in the command.

(4) The commanding officer of the troops takes post 5 paces in front of the center of the leading element. He then commands: 1. **Forward,** 2. **MARCH.** At the command **March,** the commanding officer, the persons to be decorated, and the colors advance, the band playing. The commanding officer of the troops marches on the reviewing officer. In all ranks the guide is center. The detachment is halted by the commanding officer of the troops when he has reached a point 10 paces from the reviewing officer by the command: 1. **Detachment,** 2. **HALT.** He then salutes the reviewing officer and reports "Sir, the persons (colors) to be decorated are present." The reviewing officer returns the salute and directs that the command be presented. The commander of the troops returns to his post in front of the center of his command by moving around the right flank of the persons or colors to be decorated and then directly to his post. On reaching his post he commands: 1. **Present,** 2. **ARMS,** faces about and salutes. The band then plays *The National Anthem.* If only field music is present, it sounds *To the Color.* On completion of the music, the commanding officer of the troops brings the command to the order. The persons to be decorated salute and terminate the salute at the commands **Present arms** and **Order arms,** respectively, of the commanding officer of the troops.

c. A designated officer of the staff then reads the order announcing the awards. After the reading of the order, the reviewing officer, accompanied if necessary by his staff or designated members thereof, advances to the colors and to the line of persons to be decorated and fastens the appropriate streamer to the staff of the color, and pins the decoration awarded on the left breast of each person. He then directs the commanding officer of the troops to march the command in review and resumes his post. The persons decorated form line on the left of the reviewing officer or as otherwise directed, and the colors return to their posts by the most direct route.

d. Foreign decorations will be presented by means of a similar ceremony.

Section V.—ESCORTS

5-14. Escort of the color.—*a.* (1) The regiment being in line of battalions in column of close columns, the regimental commander details a company, other than the color company, to receive and escort the national color to its place. During the ceremony the regimental color remains with the color guard at its post with the regiment.

(2) The band moves straight to its front until clear of the line of field officers, changes direction to the right, and halts. The designated company forms column of platoons 15 paces in rear of the band with the color bearer in the line of file closers of the center platoon.

(3) The escort then marches without music to the regimental commander's office or quarters and forms in line facing the entrance.

(4) The color bearer, preceded by the senior junior officer and followed by a petty officer of the escort, obtains the color.

(5) When the color bearer returns, followed by the junior officer and the petty officer he halts before the entrance, facing the escort. The junior officer places himself on the right, and the petty officer on the left, of the color bearer. The escort then presents arms, and the field music sounds *To the Color*. The junior officer and the petty officer salute at the command of the company commander.

(6) Arms are brought to the order; the junior officer and the petty officer return to their posts. The company is formed in column of platoons, the band taking post in front of the column. The color bearer places himself in the center of the space in rear of the center platoon. The escort then marches in quick time, with guide left, back to the regiment, the band playing. The march is conducted so that the escort arrives at a point 50 paces in front of the right of the regiment, and then passes parallel to its front. When the color arrives opposite the center of the regiment, the escort is formed in line to the left. The color bearer, passing between the platoons, advances and halts 6 paces in front of the regimental commander.

(7) The color bearer having halted, the regimental commander, who prior to the arrival of the color bearer has taken post 30 paces in front of the center of the regiment, turns about and commands: 1. **Present**, 2. **ARMS**. The regimental commander then turns to the front and salutes. The field music sounds *To the Color* when the regimental commander salutes.

(8) The regimental commander then turns about and brings the regiment to the order and the color bearer takes post as shown in Figure 76, paragraph 4–17.

(9) The escort executes **present** and **order arms** at the command of its commander, who then forms it in column of platoons, and preceded by the band marches it to its place, passing around the left flank of the regiment.

(10) The band plays until the escort passes the left of the line. It then returns to its post on the right, passing in rear of the regiment.

(11) The regiment may be brought to rest when the escort passes the left of the line.

b. Escort of the color is executed by a battalion according to the same principles.

5–15. Escorts of honor.—*a.* Escorts of honor are detailed for the purpose of receiving and escorting personages of high rank, civil or military. The troops detailed for this duty are selected for their military appearance and superior discipline.

b. The escort forms in line, opposite the place where the personage is to present himself, the band on the flank of the escort toward which it is to march. On the appearance of the personage, the honors due his rank are rendered. The escort then forms column of platoons or squads and takes up the march. The personage with his staff or retinue takes position in rear of the column. When the personage leaves the escort, line is again formed, and the same honors rendered as on his arrival.

c. When the position of the escort is at a considerable distance from the point where the personage is to be received, as for instance where a courtyard or wharf intervenes, a double line of sentinels, facing inward, is posted from that point to the escort. The sentinels successively salute as the personage passes and then are relieved and join the escort.

d. An officer is designated to attend the personage and bear such message as he may desire to send to the commander of the escort.

5–16. Funeral escort.—*a.* (1) The composition and strength of the escort are prescribed in Navy Regulations.

(2) The escort is formed opposite the place where the body of the deceased rests, the band on the flank of the escort toward which it is to march.

(3) Upon the appearance of the casket, the commander commands: 1. **Present,** 2. **ARMS,** and the band plays an appropriate air. At the conclusion of the music, arms are brought to the order. Other organizations are brought to attention by their commanders, who then salute.

(4) The escort forms column of platoons or squads. Escorts of the strength of a platoon or less may form line. (See art. 6–12.)

(5) The procession forms in the following order: 1. Music, 2. Escort, 3. Clergy, 4. Body and pallbearers, 5. Body bearers, 6. Mourners in inverse order of rank: (*a*) Enlisted men, (*b*) Officers from ship of deceased, (*c*) Other officers, (*d*) Foreign officers. 7. Distinguished persons, 8. Delegations, 9. Societies, 10. Citizens.

(6) When the procession has been formed, the band and the escort are put in march by the commander of the escort. Elements in rear conform.

(7) The procession marches slowly to solemn music.

(8) When the column arrives at the burial ground, the escort is formed in line facing the grave. The remaining elements are conducted as close as practicable to the grave. When the casket is removed from the caisson or hearse the escort presents arms and the band plays an appropriate air. The casket is carried along the front of the escort and placed over the grave. When the casket is placed over the grave the escort is brought to the order and the band ceases playing.

(9) The commander of the escort then commands: 1. **Parade,** 2. **REST.** The escort executes **parade rest,** with the officers and men inclining the head. Other organizations present execute the same movement at the command of their commanders. They resume the attention in a similar manner.

(10) When the funeral services are completed and the casket lowered into the grave, the commander causes the escort to resume attention, to elevate the muzzles of the pieces and to fire three volleys of blank cartridges. When the escort is larger than a company, one company is designated to fire the volleys.

(11) A bugler then sounds *taps.*

(12) The band and the escort are then put in march in quick time by the commander of the escort. Elements in rear conform. The band does not play until it has left the inclosure.

(13) When the distance to the place of interment is considerable, the escort, after leaving the dock or navy yard, may march at ease in quick time until it approaches the burial ground, when it is brought to attention. The band does not play while the troops are marching at ease.

(14) The field music may alternate with the band in playing.

b. At the funeral of a person entitled to the honor, when arms are presented, the band plays the prescribed national air, or the field music sounds *To the Color,* a march, flourishes, or ruffles, according to the rank of the deceased. On conclusion of the musical honors, the band plays an appropriate air.

c. At the funeral of a mounted officer or man, his horse, in mourning caparison, follows the hearse or caisson.

d. Should the entrance of the cemetery prevent the hearse or caisson from accompanying the escort to the grave, the column is halted at the entrance long enough to take the casket from the hearse or caisson, when the troops are again put in march.

e. When necessary to escort the remains to a place where they are to rest before the funeral service, arms are presented upon receiving the remains and also as they are borne into the church or other place of rest.

f. Prior to the funeral the necessary arrangements are made by the commander of the escort or a designated officer and the clergyman.

g. At a military funeral, all persons in the military service in uniform or civilian clothes, attending in their individual capacity, will stand at attention uncovered and hold the headdress over the left breast, while the casket is being carried to

and lowered into the grave, while taps is being sounded, and during the services at the grave. During the prayer they also bow their heads. In inclement weather the headdress may be raised and held over the head.

Section VI.—INSPECTIONS

Company Inspection

5–17. The company opens ranks as described in chapter 3.

Each platoon leader aligns the front rank, rear rank, and file closers of his platoon, takes post 3 paces in front of the right guide, facing to the left, and commands: **Front**, and faces to the front.

The c. c. then commands: **Rest**, and commencing at the head of the column makes a minute inspection of the arms, accouterments, dress, and ammunition of the personnel of the several platoons and company headquarters. As he approaches each platoon, its leader faces to the left and commands: 1. **Platoon**, 2. **ATTENTION**, 3. **PREPARE FOR INSPECTION**, and faces to the front; as soon as inspected, he accompanies the c. c.

The inspection is from right to left in front, and from left to right in rear, of each rank and of the line of file closers.

Each man, as the c. c. approaches him, executes **inspection arms.** (Arts. 2–30 and 2–31.)

The c. c. takes the piece, grasping it with his right hand just above the rear sight (model 1903 rifle) or the lower band (model 1917 rifle), the man dropping his hands. The c. c. inspects the piece, and with the hand and piece in the same position as in receiving it, hands it back to the man, who takes it with the left hand at the balance and executes **order arms.**

Men successively execute **inspection arms**, as the inspecting officer returns the piece to the man on their right.

Should the piece be inspected without handling, each man executes order **arms** as soon as the c. c. passes to the next man.

Enlisted men armed with the pistol execute **inspection pistol** by drawing the pistol from the holster and holding it diagonally across the body, barrel up, and 6 inches in front of the neck, muzzle pointing up, and to the left. The pistol is returned to the holster as soon as the c. c. passes.

Upon completion of the inspection of each platoon, its leader takes post facing to the left, 3 paces in front of the right guide, and commands: 1. **Close ranks**, 2. **MARCH**, and adds **Rest**, after the ranks after have been closed.

At the command **MARCH**, the rear rank closes to 40 inches, each man covering his file leader; the file closers close to 2 paces from the rear rank. The platoon leader then resumes his post in front of the center of the platoon.

5–18. If the company is dismissed, rifles are put away. In quarters, headdress and accouterments are removed, and the men stand near their respective bunks; in camp, they stand covered but without accouterments, in front of their tents.

If the personal field equipment has not been inspected in ranks and its inspection in quarters or camp is ordered, each man arranges the prescribed articles, on his bunk if in quarters or permanent camp, in front of his half of the tent if in shelter-tent camp.

The c. c., accompanied by the platoon leaders, then inspects the quarters or camp. The company chief petty officer precedes the c. c. and calls the men to attention on entering each squad room or on approaching the tents; the men stand at attention but do not salute.

Assembling the Pack

5–19. (1) To assemble the pack carrier to the haversack spread the haversack on the ground, inner side down, outer flap to the front. Place the buttonholed edge of the pack carrier on the buttonholed edge of the haversack, lettered side of the carrier up, buttonholes of the carrier resting on the corresponding ones of the haversack. Lace the carrier to the haversack by passing the ends of the coupling strap through the corresponding buttonholes of the carrier and haversack nearest the center of the carrier, passing the ends up through the next buttonholes and continuing to the right and left, to the sides, until they are linked together.

(2) The cartridge belt is attached next. With the pack carrier and haversack assembled, spread on the ground, inner side down, belt adjusted to man. Place

the cartridge belt, pockets down, tops to the front, along the junction of the haversack and carrier. Insert the end hook of rear belt suspender in the center eyelet of the adjusting strap, the end of the hook outside of the belt. Insert end hooks of front belt suspenders in the eyelets between the second and third pockets from the male and female fasteners.

(3) To assemble equipment with rations. Place the assembled equipment on the ground, suspender side of haversack down, pockets of cartridge belt up, haversack spread out, inner flap and pack carrier extended their full length to the rear.

An emergency ration for two days' service may be issued to each man and carried in the haversack, consisting of four cartons of hard bread (20 ounces) in the center of the haversack body, the lower ones on a line of attachment of the inside flap. Lay the remaining ones at the head, the bacon can and the condiment can at the head of the bread, bacon can at the bottom, containing 2 pounds, condiment can on top (coffee, 4 ounces; sugar, 8 ounces; three days' rations of salt in the cover).

The socks and toilet articles are rolled, towel on the outside, into a neat roll of the same approximate dimensions as a carton of bread, and are placed in front of the cans, at the head of the haversack.

The inner flap of the haversack is folded over these articles, the end of the flap being turned in so that the flap tends to hold the towel and rations firmly. The sides of the haversack are folded over the sides of the rows; the upper binding straps are passed through the loops on the outside of the inside flap, each strap through the loop opposite the point of its attachment to the haversack body, and fastened to the tongueless bar buckles on the opposite side. The straps are then pulled tight to make the fastening secure. The outer flap is folded over and fastened by means of the lower haversack binding strap and the tongueless bar buckle on the inside of the outer flap. The strap is pulled tight, drawing the outer flap singly over the filled haversack.

(4) Spread shelter-tent half on the ground with tie-ties up. Lay tie-ties and guy rope across shelter-tent half and fold triangular end over, making it rectangle

(5) Spread blanket on shelter half, stripes paralleling ridge, with name down and end bearing name on side of ridge. Fold ends of blanket over so they meet in center. This will make a long pack. For a short pack the blanket ends should overlap, the extreme overlap being 8 inches. Move blanket so that edge rests on ridge, which leaves from 18 to 26 inches of tent exposed at bottom.

(6) Standing at the front end of the tent, ridge on the right, place the clothing in the following order on the left half of the blanket and about 1 foot from the front edge of the tent:

One pair of trousers and one jumper (O. D. shirt), side by side, jumper (O. D. shirt) on the right. On top of the trousers place one pair of drawers; on top of the jumper (O. D. shirt) place one undershirt. Across the clothing place two pairs of socks.

For the navy a white cap and watch cap are added and form the outer layer. The width of the clothing will be the width of the fold of the blanket. Between the clothing and front edge of tent and close to clothing, place 1 pair of shoes, one sole down, and one sole up, toes overlapping. Shelter-tent pins and pole are placed on blanket at opposite end of and close to clothing. (See fig. 80.)

(7) Fold end of blanket at front of tent over shoes. Then fold right half of blanket over left half, covering clothing. Then take end of blanket farthest away from clothing, fold it over to a line between clothing and shoes. Fold bottom edge of tent over blanket, then fold ridge over this. Fold over about 1 foot of end of tent farthest from clothing to form a pocket. Beginning at front edge, roll compactly into this pocket.

(8) To place the pack in the pack carrier, grasp the lower suspension at the base of the pack carrier, one in each hand; place the right knee against the bottom of the roll; pull the carrier down and force the pack up close against the bottom of the packed haversack; without removing the knee, pass the lower carrier binding strap over the pack and secure it by means of the opposite buckle; in a similar manner secure the bottom haversack binding strap and then the upper carrier binding strap. Engage the snap hook on the pack suspenders in the lower suspension rings. The equipment is now assembled and packed ready to be further adjusted to the man.

(9) The poncho will be folded to suitable size and carried in haversack on top of rations.

Assembling the Pack Without the Shelter Half

5–20. Without the shelter half, the pack is similarly assembled with the following modifications:

(1) Spread blanket on the ground, name down, top of blanket on the right. Fold top and bottom of the blanket toward each other until they meet in the center, or overlap, if short pack is desired.

(2) Place clothing as above described, on the near side of the left flap of the blanket, and about 1 foot from its rear edge. Place the shoes as above described, next the clothing and on the near side of the left flap. Fold near side of the blanket over the shoes. Fold right half of the blanket over the left half. Fold far side of the blanket over about 1 foot to form a pocket. Beginning at the clothing end of the pack (near side) roll compactly into the pocket.

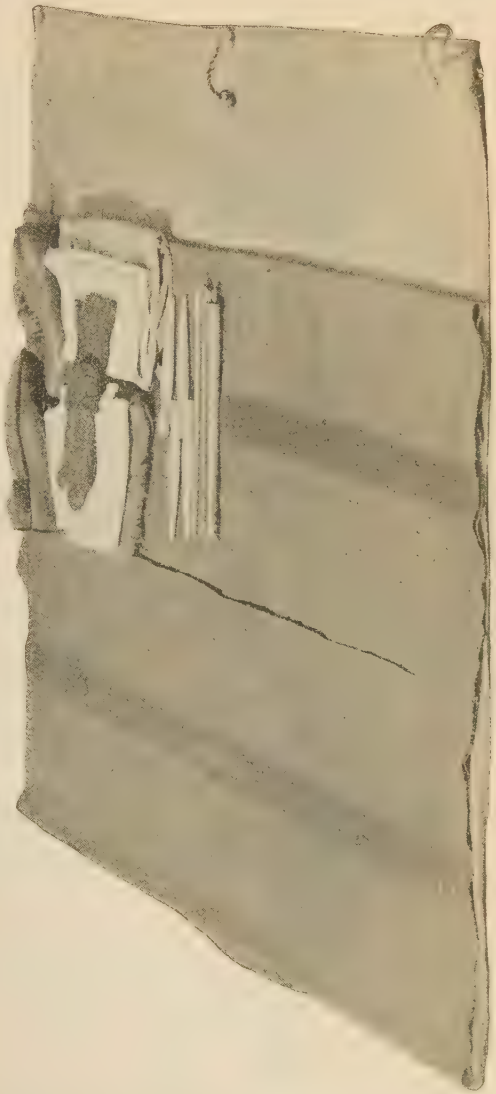

FIG. 80

Special Equipment

5–21. (1) The machete or wire cutter will be attached to the belt under the second pocket from the rear of the left pocket section.

(2) The pistol, when worn, will be attached to the belt under the third pocket from front, in right pocket section.

(3) To assemble the bayonet scabbard to the haversack disengage the bayonet from the scabbard and attach the scabbard by passing its lower end through the loop provided on the left side of the haversack body, then engage the double hook attachment in the eyelets on the outer flap on the haversack, inserting the hooks from the inside. Place the bayonet in the scabbard eye to the front, edge of blade to the rear.

(4) To assemble the shovel carrier to the haversack fold the outer flap of the haversack over so that the meat-can pouch is uppermost and engage the double hook attachment in the eyelets in the intrenching tool attachment, inserting the hooks from the under side. Place the intrenching tool in the carrier and secure it by its binding strap. Place the meat can in the meat-can pouch.

(5) To assemble the pick-mattock carrier to the cartridge belt disengage the pick mattock and handle from the carrier. Attach the pick-mattock carrier to the belt under the rear pocket of the left section of the belt by inserting

one hook of the double hook attachment in the eyelet from the inside of the belt; pinch the base of the pocket, bringing the eyelets close together, then insert the hook in the same manner. With lower part of the carrier body released by its strap, insert the point of the pick mattock into the top handle loop which forms a pocket for the point, and secure the blade by folding the lower body over, and fasten in position by a strap which passes through a loop to the body through a tongueless bar buckle sewed to the other end of the strap. Insert the pick-mattock handle through the top handle loop by the double hook and the lower handle loop by the front of the body.

FIG. 81

(6) To assemble the ax carrier to the cartridge belt disengage the ax from the ax carrier. Assemble the ax carrier under the second pocket of the left pocket section of the belt in the same manner as the pick-mattock carrier.

(7) To assemble the canteen cover to the cartridge belt disengage the canteen and cup from the cover, the cover being flexible and easier to attach. Attach the canteen cover to the belt under the rear pocket of the right pocket section of the belt by inserting one hook of the double hook attachment in the eyelet from the inside of the belt. Pinch the base of the pocket, bring eyelets close together, then insert the other hook in the same manner. Insert the canteen in the cup (assembled), place them in the cover, and secure the flaps.

(8) The first-aid pouch is attached under the second pocket of the right pocket section of the belt in the same manner as the canteen cover. Place the first-aid packet in the pouch and secure the cover.

Examination of Equipment in Ranks

5–22. If the inspection is to include an examination of the equipment while in ranks, the c. c., after closing ranks, causes the company to stack arms, to march backward until 4 paces in rear of the stacks and to take intervals. He then commands: 1. **UNSLING EQUIPMENT.** 2. **OPEN PACKS.**

At the first command, each man unslings his equipment and places it on the ground at his feet, haversack to the front, end of the pack 1 foot in front of toes.

At the second command, pack carriers are unstrapped, packs removed and unrolled, the longer edge of the pack along the lower edge of the cartridge belt.

Each man unfolds blanket so as to expose contents of pack; removes meat can, knife, fork, and spoon from the meat-can pouch, and places them on the blanket in front of the shelter-tent pins, in following order from rear to front: Meat can, cover, knife on sheath, fork on sheath, spoon, first-aid kit, canteen (on right), cup (on left); draws bayonet, places it on blanket to left of meat can and cover, hilt to front; unstraps and spreads out haversack so as to expose its contents; folds up pack carrier so that it rests on edge of blanket, opens haversack, folds up

inside flap of haversack so that its edge is on line with pack carrier; places folded poncho over haversack flap so that its longer edge is on a line with pack carrier; places bacon and condiment cans (former on left, top off) on top of poncho; unrolls towel, exposing toilet articles, the towel resting on haversack in front of poncho; removes intrenching tool from carrier and places over outer haversack flap. Each man then resumes the position of attention. Figure 81 shows the relative position of all articles, except special articles.

The c. c. then passes along the ranks and file closers as before, inspects the equipment, returns to his position in front of the center of the leading platoon, and commands: **CLOSE PACKS.**

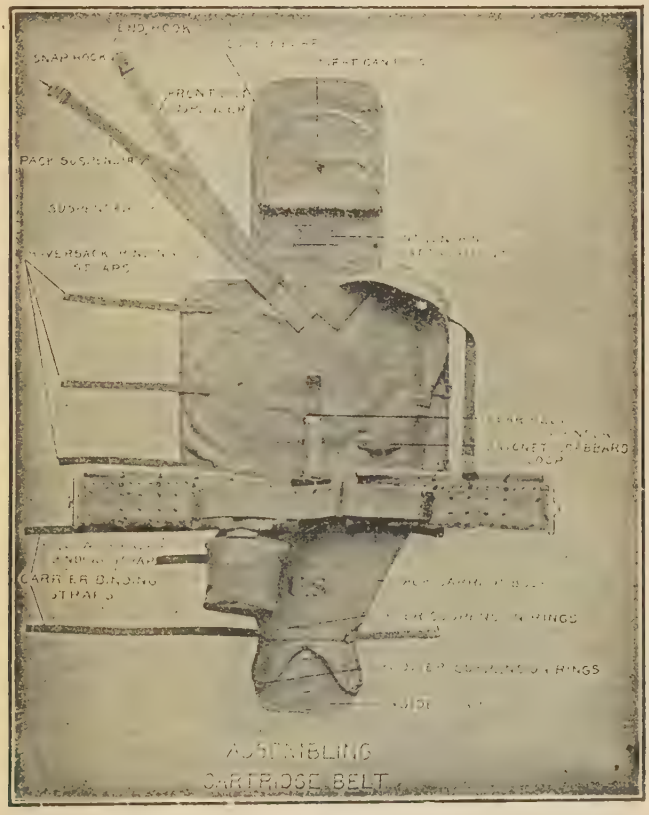

FIG. 82

Each man rolls up his toilet articles and underwear, straps up his haversack and its contents, replaces the meat can, knife, fork, and spoon, and the canteen and cup; closes cartridge pockets and first-aid pouch; restores special articles to their proper receptacles; rolls up and replaces pack in carrier; and leaving the equipment in its position on the ground, resumes the attention.

All equipments being packed, the c. c. commands: **SLING EQUIPMENT.**

The equipments are slung, and belts fastened.

The c. c. then causes the platoons to assemble and take arms. The inspection is completed as already explained.

5–23. The p. o. or enlisted man in charge of company headquarters prepares the detachment for inspection as prescribed for platoon leaders, posting his detachment at ten paces from the rear platoon before opening ranks.

5–24. The c. c. may direct the platoon leaders to make the detailed inspection of the arms, equipment, etc., of the men of their platoons.

The second in command accompanies the c. c. throughout the inspection or makes such part of the inspection as the c. c. may direct.

5–25. Should the inspector be other than the c. c., the latter, after commanding **REST**, faces to the front. When the inspector approaches, the c. c. faces about, brings the company to attention, faces to the front, and salutes. As soon as inspected, he faces about, commands: **REST**, and accompanies the inspector. The inspection proceeds as before.

Battalion Inspection

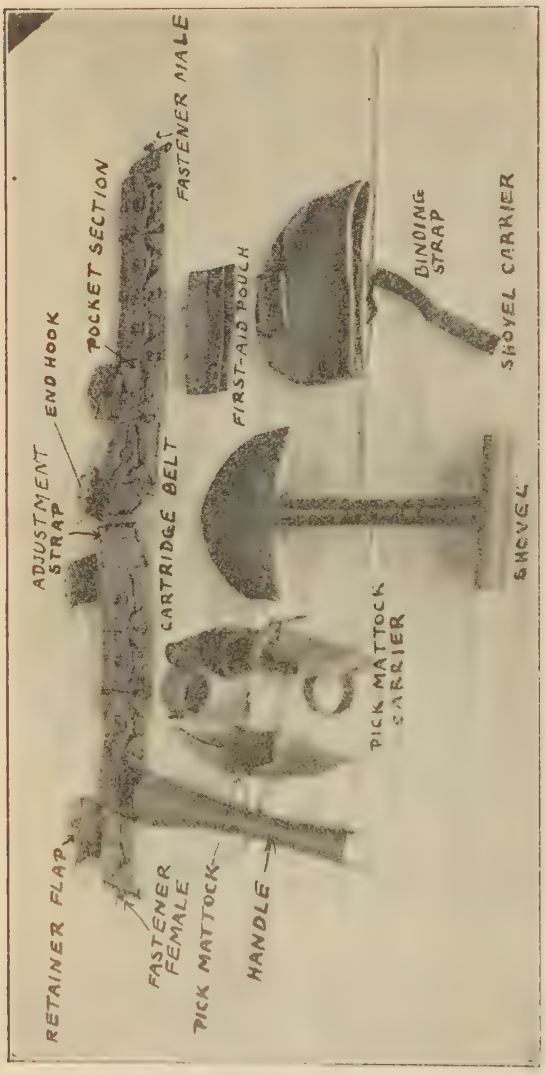

FIG. [illegible] Cartridge belt and intrenching tools

5–26. If the formation is to include both inspection and review, the inspection may either precede or follow the review.

The battalion is formed in line of close columns all officers dismounted. The bn. c. causes the companies to extend to full distance; the band, p. o. staff, and colors conform to the movement of the companies.

The bn. c. commands: 1. **Prepare for inspection,** 2. **MARCH.**

At the first command, each c. c. commands: **Open ranks.**

At the command **march,** ranks are opened in each company as in the inspection of the company.

Buglers join their companies.

The band opens ranks.

The inspector inspects the bn. c. and, accompanied by the latter, inspects the staff officers.

The bn. c. then commands: **REST,** and with his staff accompanies the inspector.

If the bn. c. is the inspector, he commands: **REST,** and inspects his staff, which then accompanies him.

The inspector, commencing at a flank of the battalion, then makes an inspection of the arms, accouterments, dress, and ammunition of each enlisted man of the band, the several companies, the color guard, and the p. o. staff.

The adjutant gives the necessary commands for the inspection of the band, the color guard, and the p. o. staff.

When the inspector approaches the band, the adjutant commands: **PREPARE FOR INSPECTION.**

As the inspector approaches him, each man raises his instrument in front of the body, reverses it so as to show both sides, and then returns it.

Buglers execute inspection similarly.

The band plays during the inspection of the companies.

As the inspector approaches each company, its commander commands: 1. Company, 2. **ATTENTION,** and faces to the front; as soon as inspected, he faces about, commands: **REST,** and accompanies the inspector. The inspec-

tion proceeds as in company inspection. At the completion of the inspection of the petty officers staff and each company, the battalion commander directs their dismissal, unless otherwise directed by the inspector.

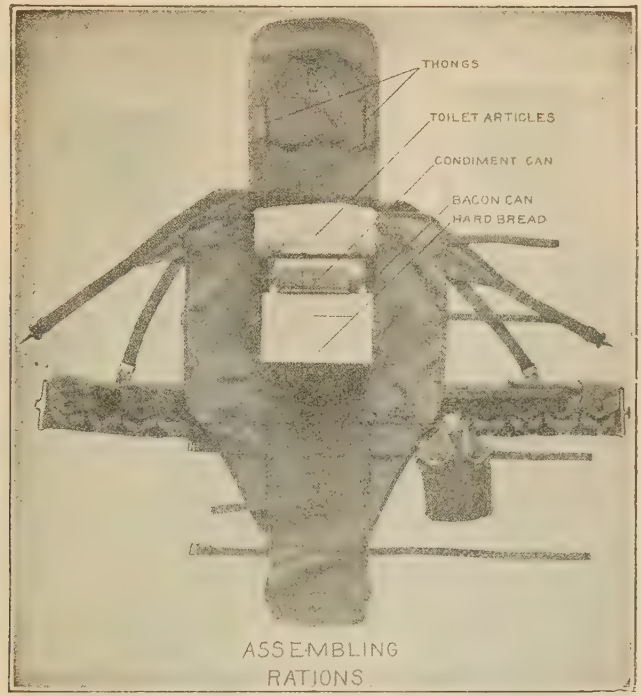

FIG. 83

5–27. If the inspection will probably last a long time, the companies not under inspection may be permitted to stack arms and fall out; as the inspection of the preceding company nears completion, they fall in and take arms.

5–28. At the inspection of quarters or camp, the inspector is accompanied by the c. c., followed by the other officers or by such of them as he may designate. The inspection is conducted as described in company inspection.

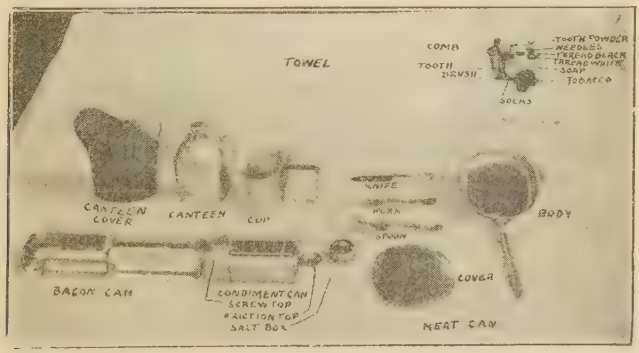

FIG. 83a.—Detail of equipment

Regimental Inspection

5–29. The commands, means, and principles are the same as described for the battalion. The regiment may be formed in any suitable formation required

by the space and ground available. Before opening ranks battalions and companies are extended to full distanee. Battalions are prepared for inspection as prescribed for battalion inspection. Upon the approach of the inspecting officer each bn. c. brings his battalion to attention and salutes. Battalion inspection follows.

Only in very exceptional situations will a regimental inspection be ordered. As a rule inspections will be as indicated for the battalion.

Fig. 84

Fig. 85

Section VII.—GUARD MOUNTING

5–30. General rules.—*a.* Guard mounting may be formal or informal, as the commanding officer directs.

b. The commanding officer prescribes the uniform, arms, and equipment for guard duty.

5–31. Formal guard mounting.—*a.* When assembly is sounded, and at the command of the c. p. o., the men going on guard fall in by detail on their company parade ground in two ranks, as prescribed for the squad, and with the petty officers in the file closers. The c. p. o. verifies the detail, inspects it, replaces those unfit for guard, turns the detail over to the senior petty officer, and retires. If there is no petty officer with the detail, the c. p. o. turns the

detail over to a petty officer of the company previously designated for the duty of marching the detail on guard. The band takes its place on the guard parade ground so that the left of its front rank is 12 paces to the right of the point where the right of the front rank of the guard is to be when formed. The adjutant signals to the band when adjutant's call is to be sounded and at the same time indicates whether the march music will be in quick or double time. Should double time be indicated, the adjutant and bn. c. p. o. conform to the music in taking their places.

b. (1) Immediately following *adjutant's call*, the band plays march music; the adjutant, with the bn. c. p. o. on his left, marches to the place on the parade ground selected for the ceremony. The adjutant halts and takes post so as to be 12 paces in front of and facing the center of the guard when formed. The bn. c. p. o. continues 12 paces, moves by the left flank, halts and faces about at 12 paces, to the left of the front rank of the band. The details are marched in quick or double time (as the music indicates) to the parade ground by their senior petty officers or the petty officers designated to command them. The post of the petty officer in command of a detail is abreast of the left-flank man of the front rank. The detail that arrives first will be marched toward the line with the guide right, so that, upon halting, the middle of the breast of the right front-rank man will be as near the left arm of the bn. c. p. o. as proper halting will permit. The commander of the detail, remaining at the right shoulder, halts his detail, steps forward until directly in front of the bn. c. p. o., executes right face, and commands: 1. **Right**, 2. **DRESS**. The detail dresses up to the line established by the right front-rank man, who at the second command places the middle of his breast against the left arm of the bn. c. p. o. in such a way as to cause the fronts of the two men to be perpendicular. The detail aligned, the commander commands: **FRONT**, salutes, and then reports "The detail is correct," or "(so many) men are absent." The bn. c. p. o., after the report is made, returns the salute. The commander, when a part of the detail, then moves in quick or double time (as the music indicates) 2 paces beyond the bn. c. p. o., when he marches by the right flank past the right of the line of file closers and again by the right flank to a point 2 paces in rear of the right file of his detail, when he halts, executes right face, and either dresses on the line of file closers or establishes that line. The petty officers specially designated to march the details on guard and not a part of the details follow the same procedure, except that after their first change of direction by the right flank after passing the bn . . p. o., they march 30 paces obliquely to the right rear and leave the parade ground without interfering with the ceremony.

(2) Should there be more than one detail, each additional detail is formed in like manner on the left of the one preceding. The commander of each detail dresses its ranks on their proper lines. When necessary, he closes the rear rank to the right and fills blank files with the men from his front rank.

c. (1) When the last detail has formed, the band ceases to play, the bn. c. p. o. faces to the right; steps 2 paces to the front, faces to the left, draws sword, if so armed, and commands: **COUNT OFF**. When the guard has counted off he sees that it is ready to march in squad formation. If there be more than five squads he divides the guard into two platoons. For this purpose he leaves his post, proceeds to and designates the dividing line between the platoons and from this position commands: 1. **Second Platoon**, 2. **Left step**, 3. **MARCH**, 4. **Platoon**, 5. **HALT**. The command **Halt** is given at the proper time to insure an interval of 7 paces between platoons. He then passes completely around the guard and takes his post 2 paces to the right of the front rank and facing the point of rest. In passing around the guard, the bn. c. p. o. executes by the left flank at each necessary turn. Upon taking his post he commands: 1. **Open ranks**, 2. **MARCH**, and proceeds as in subparagraph *c* (2).

(2) The bn. c. p. o. aligns the guard whether consisting of one or two platoons, in a similar manner as a platoon leader aligns a platoon. After giving the command **FRONT**, he moves parallel to the front rank until opposite the center, executes by the right flank, halts 6 paces in front of the adjutant, salutes and reports "Sir, the details are correct," or "Sir,——(so many) men are absent." The adjutant returns the salute, directs the bn. c. p. o.: **TAKE YOUR POST**, and then draws sword. The bn. c. p. o. then faces about, and moves by the right oblique directly to a point 3 paces beyond the left of the front rank, halts on the line of the front rank, faces to the front, and brings his sword to the order, if so armed. When the bn. c. p. o. leaves his post to report to the adjutant, the officer of the guard takes post 10 paces in rear of the right front-rank man of the guard. When there is a junior officer of the guard he takes post on the left of the senior officer of the guard. After the bn. c. p. o. has reported to the adjutant,

the officer of the guard moves from the rear of the guard, passes around the right flank, and takes post, facing to the front, 8 paces in front of the center of the guard and draws sword. If there be a junior officer of the guard he moves with the senior officer of the guard and takes post, facing to the front, 3 paces in front of the center of the first platoon and draws sword. If the guard has not been divided into platoons the senior officer of the guard takes post, facing to the front, 3 paces in front of the center of the guard and draws sword and the junior officer of the guard (if there be one) takes post, facing to the front, 3 paces to the left of the senior and draws sword.

(3) The adjutant then commands: 1. **Officer (or officers) and petty officers,** 2. **Front and center,** 3. **MARCH.** At the command **Center,** the officer or officers carry sword, and the petty officers in the line of file closers face toward the nearest flank. At the command **March,** the officer or officers advance and halt, remaining at the carry, 3 paces from the adjutant. In moving to the front and center the junior officer of the guard (if there be one) marches forward with and takes position to the left of the senior. The petty officers pass around the flanks of the guard, move by the most direct route, and form in line in order of rank from right to left facing to the front and 3 paces in rear of the officer or officers of the guard. They remain at the right shoulder. If there is no officer of the guard, the petty officers halt on a line, facing to the front, 3 paces from the adjutant. When the officer or officers and petty officers have halted, the adjutant, remaining at carry sword passes along the front of each rank from the right and assigns the officer or officers and petty officers according to rank as follows: "Commander of the guard," "leader of first platoon," "leader of second platoon," "right guide of first platoon," "**left guide of first platoon,**" "**right guide of second platoon,**" "left guide of second platoon," and "file closers," or, if the guard is not divided into platoons, "Commander of the guard," "junior officer of the guard" (if present), "right guide," "left guide," and "file closers." If the guard has been divided into platoons, the junior officer of the guard (if present) is assigned as "leader of first platoon."

(4) The adjutant then resumes his position in front of the guard and commands: 1. **Officer (or officers) and petty officers,** 2 **Posts,** 3. **MARCH.**

At the command **Posts,** all, except the officer commanding the guard, face about. At the command **March,** they step off together and take the posts assigned to them by the adjutant. They move by the most direct route. If the guard is not divided into platoons, the junior officer of the guard (if present) takes post on the right of the line of file closers covering the right guide. The adjutant then directs the commander of the guard "Inspect your guard, sir." The adjutant then returns sword. The officer commanding the guard faces about, commands: **PREPARE FOR INSPECTION,** returns sword, and proceeds to inspect the guard. The commander of the guard may direct the junior officer of the guard to assist in the inspection.

(5) During the inspection the band plays. The adjutant observes the general condition of the guard and causes to fall out any man who is unfit for guard duty or does not present a creditable appearance. Men so fallen out march off in rear of the guard. Substitutes for men fallen out report to the commander of the guard at the guardhouse.

The adjutant, when so directed, selects orderlies and color sentinels. He notifies the commander of the guard of his selection.

If there be no officer of the guard, the adjutant inspects the guard. A petty officer commanding the guard or commanding a platoon of the guard takes post as prescribed for an officer, after he has been so designated by the adjutant.

d. (1) The inspection ended, the adjutant places himself about 30 paces in front of and facing the center of the guard, and draws sword. The new officer of the day takes post in front of and facing the center of the guard, about 30 paces in rear of the adjutant. The old officer of the day takes post 3 paces to the right of and 1 pace to the rear of the new officer of the day. The officers of the day without drawing sword take the position of parade rest with the adjutant and resume the attention with him.

The commander of the guard takes his post in front of the guard. If he be an officer he draws sword with the adjutant and comes to the order.

(2) The adjutant then commands: 1. **Parade,** 2. **Rest,** 3. **SOUND OFF,** and comes to the order and parade rest.

(3) **SOUND OFF.** The band in place plays the "**Sound Off**" of three chords, giving two beats in quick time to each chord and at the conclusion of the third chord moves forward playing in quick time, passes to the left of the line between the officer of the guard and the adjutant and back to its post on the right, when it halts and ceases playing, the "**Sound Off**" being again played.

(4) The adjutant then comes to attention, carries sword and commands: 1. **Guard**, 2. **ATTENTION**, 3. **Close ranks**, 4. **MARCH**.

(5) The ranks are closed without command from platoon leaders.

(6) The adjutant then commands: 1. **Present**, 2. **ARMS**, faces toward the new officer of the day, salutes, and then reports "Sir, the guard is formed." The new officer of the day, after the adjutant has reported, returns the salute with the hand and directs the adjutant: "March the guard in review, Sir," or "March the guard to its post, Sir."

(7) The adjutant carries sword, faces about and brings the guard to the order. When directed to march the guard to its post, the adjutant repeats the command and the commander of the guard marches the guard directly to the guardhouse in the most practical manner. The band and field music are dismissed. Otherwise the adjutant commands: 1. **(At trail), platoons (or guard) right**, 2. **MARCH**, 3. **Guard**, 4. **HALT**.

(8) At the second command the guard executes the movement and the band turns to the right and places itself approximately 12 paces in front of the first platoon. The band halts with the guard at the fourth command.

(9) The adjutant places himself 6 paces from the left and 3 paces in front of the front rank of the guard; the bn. c. p. o. 6 paces from the left flank of the front rank of the second platoon, or 6 paces from the left flank of the front rank of the guard when there is no division into platoons.

(10) The adjutant then commands: 1. **Pass in review**, 2. **Forward**, 3. **MARCH**.

(11) The guard moves in quick time with the band playing past the officer of the day marching and saluting according to the principles of review. The adjutant and the commander of the guard salute together, leaders of platoons and drum major salute with their units, and the bn. c. p. o. salutes with the unit by which he is marching.

(12) The band having passed the officer of the day, turns to the left out of the column, places itself opposite and facing him at a distance of 20 paces from where the left flank of the guard passes, and continues to play until the guard leaves the parade ground. The field music detaches itself from the band when the latter turns out of the column and, remaining in front of the guard, commences to play when the band ceases.

(13) Having passed 12 paces beyond the officer of the day the adjutant halts. The bn. c. p. o. halts abreast of the adjutant and 1 pace to his left. The adjutant, and bn. c. p. o. if so armed, then return sword, face each other, salute, and retire. The commander of the guard then commands: 1. **Platoons right by squads (or Right by squads)**, 2. **MARCH**, and marches the guard to its post.

(14) The officers of the day face toward each other and salute. The old officer of the day turns over the orders to the new officer of the day.

(15) While the band is sounding off and while the guard is marching in review, the officers of the day stand at parade rest with arms folded and raised so that the upper arms are horizontal. They take this position when the adjutant comes to parade rest, resume the attention with him, again take the parade rest at the first note of the march in review, and resume attention as the head of the column approaches.

(16) The new officer of the day returns the salutes of the commander of the guard and the adjutant. He salutes only once as the adjutant and the commander of the guard salute together.

e. The new bugler of the guard forms and continues with the field music of the band and marches with the field music to the guardhouse. When the new guard is divided into reliefs the bugler relieves the old bugler of the guard and with him reports to the new officer of the day for inspection and instruction.

5–32. Informal guard mounting.—*a.* Informal guard mounting is held on the parade ground of the organization from which the guard is detailed or, if the guard is detailed from more than one organization, at such place as the commanding officer may direct.

b. At *assembly*, and at command of the co. c. p. o., the detail for guard falls in on the company parade ground. The c. p. o. verifies the detail, inspects the dress and general appearance, and replaces any man unfit for guard duty. He then turns the detail over to the commander of the detail and retires. The detail commander then reports his detail to the commander of the guard at the point designated for the assembly.

c. (1) The commander of the guard causes the guard to form as a platoon, and takes post 3 paces in front of the center of the guard, and faces to the front, with the junior officers of the guard 3 paces to his left. The officer of the day

takes his place 15 paces in front of and facing the center of the guard, and commands: 1. **Officer (or officers) and petty officers**, 2. **Front and center**, 3. **MARCH.** The officers and petty officers then take their positions, are assigned, and sent to their posts as prescribed in formal guard mounting. The officer of the day directs: **Prepare for inspection** The officer commanding the guard faces about and commands: 1. **Open ranks**, 2. **MARCH.** He then proceeds to the right flank of the guard, verifies the alignment, commands: **FRONT**, and takes post 3 paces in front of the right guide facing to the left and commands: **PREPARE FOR INSPECTION**, and faces to the front remaining at carry sword.

(2) The officer of the day then inspects the guard according to the principles of company inspection, sees to its fitness for the duty for which the guard is detailed, and selects the necessary orderlies and color sentinels. The men found unfit for guard are returned to quarters and replaced by suitable substitutes. This fact is reported by the officer of the day to the adjutant immediately after guard mounting.

(3) When the inspection is completed the officer of the day resumes his position and directs the commander of the guard to march the guard to its post. Ranks are closed and the guard marched, without music, in the most practicable manner.

(4) The new bugler of the guard forms in the line of file closers at the formation of the guard detail and reports to the officer of the day, as prescribed for formal guard mounting.

(5) When a petty officer commands the guard, the officer of the day gives the commands for opening and closing ranks and verifies the alignment.

(6) When the guard is commanded by a petty officer, he takes post as prescribed for an officer, except that in marching to the front and center he takes post on the right of the line of petty officers. At the command of the officer of the day he returns to the post prescribed for the officer 3 paces in front of the right guide.

Section VIII.—RELIEVING THE OLD GUARD

5–33. March of new guard to guardhouse.—*a.* As the new guard approaches the guardhouse, the old guard is formed in line with its field music 3 paces to its right and on the same line. When the field music at the head of the new guard arrives opposite the old guard's left, the commander of the new guard commands: 1. **Eyes**, 2. **RIGHT** (and the commander of the old guard commands: 1. **Present**, 2. **ARMS**). Commanders of both guards exchange salutes. The new guard marches in quick time past the front of the old guard.

b. When the commander of the new guard is opposite the field music of the old guard, he commands: **FRONT.** (The commander of the old guard commands: 1. **Order**, 2. **ARMS**, as soon as the new guard has cleared the front of the old guard.)

c. The field music having marched 3 paces beyond the field music of the old guard, changes direction to the right and, followed by the guard, changes direction to the left when on line with the old guard. The changes of direction are without command. The commander of the new guard halts on the line established by the old guard, allows his guard to march past him, halts it in line 3 paces to the right of the field music of the old guard, and dresses his guard to the left. The field music of the new guard halts 3 paces to the right of the new guard on the line of its front rank.

5–34. Presenting old and new guards.—*a.* After the new guard is dressed, the commander of each guard (in front of and facing its center, commands: 1. **Present**, 2. **ARMS**, resumes his front) salutes the other guard (carries sword, faces toward his guard, and commands: 1. **Order**, 2. **ARMS**).

b. If the guard is commanded by a petty officer, he takes post and executes the facings as prescribed for an officer and renders the proper salute, rifle, sword, or hand, according to his equipment.

5–35. Presenting guards to officers of the day.—After the new guard has arrived at his post and the commanders of the guards have exchanged salutes, each guard is presented by its commander to its officer of the day. If there be but one officer of the day present, or if one officer acts in the capacity of the old and new officer of the day, each guard is presented to him by its commander.

5–36. Salutes by guard.—*a.* If other persons entitled to a salute approach, each commander of the guard brings his own guard to attention if not already at attention. The senior commander of the two guards then commands: 1. **Old and new guards**, 2, **Present**, 3. **ARMS.**

b. The junior salutes at the command **Present**, given by the senior. After the salute has been acknowledged, the senior brings both guards to the order.

5–37. Dispositions of new guard.—*a.* After the salutes have been acknowledged by the officers of the day, each guard is brought to the order by its commander. The commander of the new guard then directs the orderly or orderlies to fall out and report, and causes bayonets to be fixed, if so ordered by the commanding officer. Bayonets are not thereafter unfixed during the tour except in route marches, while the guard is actually marching, or when especially directed by the commanding officer.

b. The commander of the new guard then causes to fall out members of the guard for detached posts, places them under charge of the proper petty officers, and divides the guard into three reliefs. When the guard consists of troops of different arms combined, the men are assigned to reliefs, under rules prescribed by the commanding officer, so that a fair division of duty may be assured.

5–38. Relief by new guard.—The sentinels and detachments of the old guard are at once relieved by members of the new guard. The two guards stand at ease or at rest while these changes are being made. The commander of the old guard transmits to the commander of the new guard all his orders, instructions, and information concerning the guard and its duties. The commander of the new guard then takes possession of the guardhouse and verifies the articles charged to the guard.

5–39. Dismissing old guard.—If considerable time is required to bring in that portion of the old guard still on post, the commanding officer may direct that, as soon as the orders and property are turned over to the new guard, the portion of the old guard at the guardhouse be marched off and dismissed. In such cases the remaining detachment or detachments of the old guard are inspected by the commander of the new guard when they reach the guardhouse. The latter directs the senior petty officer present to march these detachments off and dismiss them in the prescribed manner.

5–40. When field music may be dispensed with.—In bad weather, at bight, after long marches, or when the guard is very small, the field music may ne dispensed with.

Section IX.—HONORS AND SALUTES

5–41. Further rules governing honors, courtesies, etc., are prescribed in the U. S. Navy Regulations.

5–42. (1) Salutes are exchanged between officers and enlisted men not in a military formation, nor at drill, work, games, or mess, on every occasion of their meeting, passing near or being addressed, the officer junior in rank or the enlisted man saluting first.

(2) When an officer enters a room where there are several enlisted men, the warning "attention" is given by some one who perceives him, when all rise, uncover, and remain standing at attention until the officer leaves the room or directs otherwise. Enlisted men at meals stop eating and remain seated at attention.

(3) An enlisted man, if seated, rises on the approach of an officer, faces toward him, stands at attention, and salutes, if covered. If standing, he faces an officer for the same purpose. If the parties remain in the same place or on the same ground, such compliments need not be repeated. Enlisted men actually at work do not cease work to salute an officer unless addressed by him.

(4) Before addressing an officer, enlisted men execute the prescribed salute with the weapon with which armed, or if unarmed, with the right hand. He salutes after receiving a reply.

(5) In uniform, covered, but not in formation, officers and enlisted men salute military persons as follows: With arms in hand, the salute prescribed for that arm (sentinels on interior guard duty excepted); without arms, the right-hand salute.

(6) In civilian dress, covered, officers and enlisted men salute military persons by executing the right-hand salute.

(7) Officers and enlisted men render the prescribed salutes in a military manner, the officer junior in rank, or the enlisted man, saluting first. When several officers in company are saluted, all entitled to the salute return it.

(8) Except in the field under campaign or simulated campaign conditions, a mounted officer or enlisted man dismounts before addressing a superior not mounted.

(9) A man in formation does not salute when directly addressed, but comes to attention if at rest or at ease.

(10) Saluting distance is that within which recognition is easy. In general, it does not exceed 30 paces.

(11) When an officer entitled to the salute passes in rear of a body of troops, it is brought to attention while he is opposite the post of the commander.

(12) In public conveyances, such as railway trains and street cars, and in public places, such as theaters, honors and personal salutes may be omitted when palpably inappropriate.

(13) Enlisted men at all times and in all situations pay the same compliments to officers of the Army, Navy, Marine Corps, and Volunteers, and to officers of the National Guard as to officers of their own regiment, corps, or arm of service.

(14) Sentinels on post doing interior-guard duty conform to the foregoing principles but salute by presenting arms when armed with the rifle. They do not salute if it interferes with the proper performance of their duties.

5–43. (1) Commanders of detachments or other commands salute officers of higher grades by first bringing the unit to attention and then saluting as required by subparagraph (5), paragraph 5–42. If the person saluted is of a junior or equal grade, the unit need not be at attention in the exchange of salutes.

(2) If two detachments or other commands meet, their commanders exchange salutes, both commands being at attention.

5–44. Salutes and honors, as a rule, are not paid by troops actually engaged in drill, on the march, or in the field under campaign or simulated campaign conditions. Troops on the service of security pay no compliments whatever.

5–45. A company in line or close column, or a larger unit in line or line of columns, at a halt (not in the field) and armed with the rifle, is brought to **present arms** before its commander salutes in the following cases: When the National Anthem is played, or when **To the Color** is sounded during ceremonies, or when a person is saluted who is its immediate or higher commander or a general officer, or when the national or regimental color is saluted.

5–46. At parades and other ceremonies, under arms, the command renders the prescribed salute and remains in the position of salute while the National Anthem is being played; also at retreat and during ceremonies when **To the Color** is sounded, if no band is present. If not under arms, units are brought to attention at the first note of the National Anthem or **To the Color**, and the salute rendered by the officer or petty officer in command.

5–47. Whenever the National Anthem is played at any place where persons belonging to the military service are present, all officers and enlisted men not in formation stand at attention facing toward the music (except at retreat, when they face toward the flag). If in uniform, covered, they salute at the first note of the anthem, retaining the position of salute until the last note of the anthem. If not in uniform, and covered, they uncover at the first note of the anthem, holding the headdress opposite the left shoulder and so remain until its close, except that in inclement weather the headdress may be slightly raised.

The same rules apply when **To the Color** is sounded as when the National Anthem is played.

When played by the band, the National Anthem is played through without repetition of any part not required to be repeated to make it complete.

The same marks of respect, prescribed for observance during the playing of the National Anthem of the United States, is shown toward the national anthem of any other country when played upon official occasions.

5–48. Officers and enlisted men passing the uncased color render honors as follows: If in uniform, they salute as required by subparagraph (5), paragraph 5–42; if in civilian dress and covered, they uncover, holding the headdress opposite the left shoulder with the right hand; if uncovered, they stand at attention facing the colors.

5–49. In rendering honors at ceremonies, officers and leaders of platoons and equivalent subdivisions, without arms in hand, execute the first motion of the hand salute at the command **arms of present arms** and the command **right (left) of eyes right (left)**. They execute the second motion at the command **arms of order arms** and at the command **front**. P. os. commanding platoons and equivalent subdivisions and armed with the rifle execute **present arms** and **order arms** with their platoons; during exercises in the manual, they remain at order arms; in executing **eyes right (left)**, they execute the first motion of the rifle salute at the command **right (left)** and the second motion at the command **front**. For salutes with the sword, see paragraph 5–42.

5–50. Officers and p. os. saluting individually when passing in review at ceremonies execute **eyes right (left)** at the first motion of the hand salute; they return to front when the salute is terminated.

Chapter 6

MANUALS

Section I.—THE COLOR

6–1. The national and regimental flags carried by dismounted organizations are called the national color and the regimental color. The term color implies the national color. The term colors implies both the national color and regimental color. (See art. 16–40 for Raising and Lowering the Flag.)

The rules prescribing the colors to be carried by regiments and battalions on all occasions are contained in the United States Navy Regulations.

6–2. In garrison the colors, when not in use, are kept in the office or the quarters of the rg. c. and are escorted thereto and therefrom by the color guard. In camp the colors, when not in use, are in front of the rg. c. tent. From reveille to retreat, when the weather permits, they are displayed uncased; from retreat to reveille and during inclement weather, they are cased and placed in the commanding officer's office, quarters, or tent.

Colors are said to be cased when furled and protected by the oil-cloth covering.

6–3. The regimental color salutes in the ceremony of escort of the color and in rendering honors to an officer entitled to the salute of the color, but in no other case.

If marching, the regimental color salutes when at 6 paces from the officer entitled to the salute, and resumes the carry when 6 paces beyond him.

In passing in review the color guard executes **eyes right** at the command of the senior color p. o. who commands: 1. **Eyes**, 2. **right** and **front** at the saluting distance prescribed above. To an individual entitled to the honor, the regimental color salutes at the command **right** and resumes the carry at the command **front**. The man on the right flank does not execute **eyes right**. In those organizations which do not execute **eyes right** in passing in review, the standard guard omits this compliment.

The national color renders no salute except as provided in Navy regulations.

The Color Guard

6–4. The color guard consist of two color p. o.'s, who are the color bearers, and two experienced enlisted men selected by the rg. c. The senior color p. o. commands the guard and carries the national color, the junior color p. o. regimental color. The regimental color, when carried, is always on the left of the national color, in whatever direction they may face.

6–5. The color guard is formed and marched in one rank, the color bearers in the center. It is marched in the same manner and by the same commands as a squad, substituting, when necessary, **guard** for **squad**.

The color guard does not, however, execute **to the rear march**. When the unit to which it is attached moves to the rear for short distances, the color guard, at the command of the senior color p. o. executes **guard right (left) about** as does the front rank of a squad, marches to the new line, again executes **guard right (left) about** and halts in its proper place.

6–6. When battalions are formed abreast, the color company is the center company of the center battalion. When battalions are disposed one behind the other, the color company is the center company of the leading battalion. The color company of the original formation of the battalion or regiment remains the color company during subsequent movements unless otherwise directed.

6–7. The post of the color guard in the several formations of the battalion is as shown in Figure 86. During movements involving changes of formation, the color guard conforms to the plates and maintains its position with reference to the flank or end of the color company on which it was originally posted. In all changes of directions at ceremonies, the color guard moves in such manner as not to interfere with the march of units in its rear.

6–8. In line (fig. 86), the color guard is in the center of the interval on the left of the color company on line with the front rank.

In line of close columns (fig. 86) , the color guard is in the center of the interval on the left of the leading platoon of the color company on line with the front rank.

In close line (fig. 86), the color guard is in the center of the interval on the left of the color company on line with the leading guides.

When the regiment is formed in line of battalion columns or line of battalions in column of company close lines in the ceremonies of large commands, the

color guard forms in the center of the interval on the left of the leading company of the center battalion. It rejoins the color company when the regiment changes formation.

6–9. When with a battalion that takes the battle formation, the color guard joins the regimental reserve; the reserve commander directs the color guard to join a designated company.

6–10. The color guard executes neither loadings nor firings; in rendering honors, it executes all movements in the manual; in drill all movements unless specially excused.

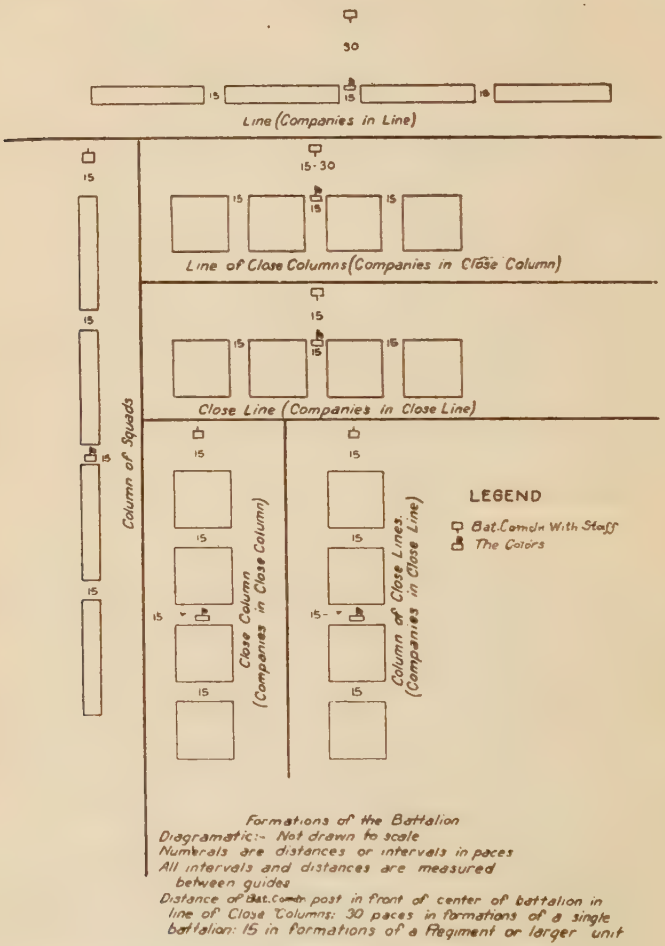

FIG. 86

(For battalion and regimental formations, including headquarters and machine-gun companies, see figs. 75 and 76)

To Receive the Color

6–11. The color guard presents arms on receiving and parting with the color at the command of the senior color p. o. After parting with the color, the color guard is brought to order arms by command of the senior member who is placed as the right man of the guard.

6–12. At drills and ceremonies in which the color is to participate, excepting escort of the color (art. 5–14), the color is received by the color company prior to the formation of the battalion.

The formation of the color company completed, the c. c. faces to the front; the color guard, conducted by the senior p. o., approaches from the front and

halts at a distance of 10 paces from the c. c., who then faces about, brings the company to the present, faces to the front, salutes, again faces about and brings the company to the order. The color guard executes the present and the order with the color company, and is then marched by the color p. o. directly to its post as indicated in Figure 86a, depending upon the formation of the color company. When the color company joins the battalion the color guard takes post as shown in Figure 75 or Figure 86; when the color battalion joins the regiment the color guard takes post as shown in Figure 76. The color is received and dismissed by organizations smaller than a company (funeral escort) in the manner prescribed in arts. 6–12 and 6–13, respectively. When the color joins the organization it takes post on the left when in line, and in rear when in column.

6–13. When it is desired to dismiss the color guard at the conclusion of a drill or ceremony in which the colors have participated, the color guard proceeds from its position and halts 10 paces in front of and facing the company commander. The company commander then faces about, brings the company to

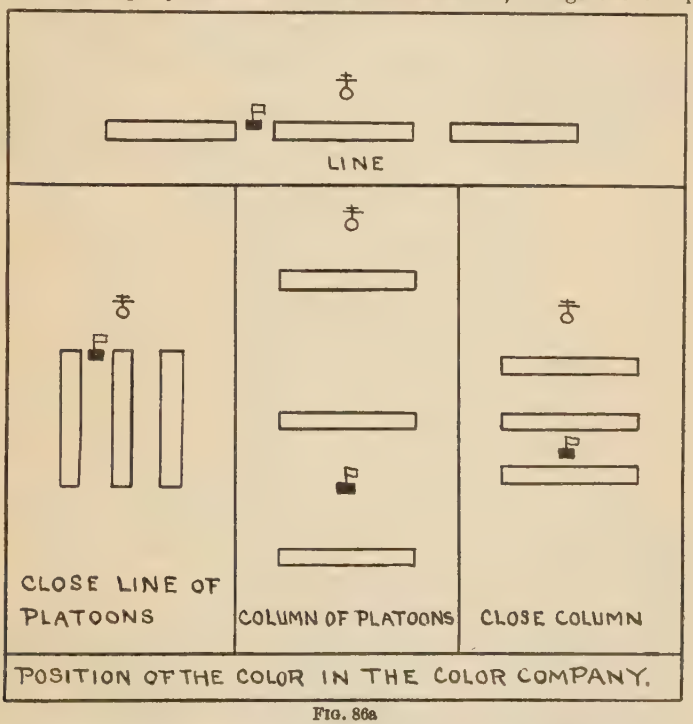

FIG. 86a

the **present**, faces to the front, salutes, again faces about and brings the company to the **order**. The color guard executes **present** and **order arms** with the color company. The color guard then escorts the colors to the office, quarters, or tent of the commanding officer.

Manual of the Color

6–14. At the **carry**, the heel of the pike rests in the socket of the sling; the right hand grasps the pike at the height of the shoulder; the pike is inclined slightly to the front.

At the **order**, the heel of the pike rests on the ground near the right toe, the right hand holding the pike in a vertical position.

At **parade rest**, the heel of the pike is on the ground, as at the **order**; the pike is held with both hands in front of the center of the body, left hand uppermost.

The **order** is resumed at the command **attention**.

The left hand assists the right when necessary.

The **carry** is the habitual position when the troops are at shoulder, port, or trail arms.

The **order** and the **parade rest** are executed with the troops.

The **color salute**: Being at the carry, slip the right hand up the pike to the height of the eye, then lower the pike by straightening the arm to the front.

The colors habitually remain at the order during the execution of the manual of arms.

Section II.—THE BAND

6–15. The band is formed in two or more ranks with sufficient intervals between the men and distances between the ranks to permit of the free use of the instruments.

The field music when united, forms with, and in rear of, the band; when the band is not present, the posts, movements, and duties of the field music are the same as prescribed for the band; when a musician is in charge, his position is on the right of the front rank. When the battalion or regiment turns about by squads, the band executes the countermarch; when the battalion or regiment executes **right**, **left**, or **about face**, the band faces in the same manner.

In marching, each rank dresses to the right.

In executing **open ranks**, each rank of the band takes a distance of 3 paces from the rank next in front; the drum major verifies the alignment.

The field music sounds the **march**, **flourishes**, or **ruffles**, and **to the color** at the signal of the drum major.

6–16. The post of the drum major is 3 paces in front of the center of the front rank. He gives the signals or commands for the movements of the band for as a squad, substituting in the commands band for squad.

Signals of the Drum Major

6–17. Preparatory to a signal, the staff is held with the right hand near the head of the staff, hand below the chin, back of the hand to the front, ferrule pointed upward and to the right.

Prepare to play: Face toward the band and extend the right arm to its full length in the direction of the staff. **Play**: Bring the arm back to its original position in front of the body.

Prepare to cease playing: Extend the right arm to its full length in the direction of the staff. **Cease playing**: Bring the arm back to its original position in front of the body.

To march: Turn the wrist and bring the staff to the front, the ferrule pointing upward and to the front; extend the arm to its full length in the direction of the staff.

To halt: Lower the staff into the raised left hand and raise the staff horizontally above the head with both hands, the arms extended; lower the staff with both hands to a horizontal position at the height of the hips.

To countermarch: Face toward the band and give the signal **to march**; each front-rank man to the right of the drum major turns to the right about, each front-rank man to the left turns to the left about; each front-rank man is followed by the men covering him. The drum major passes through the center.

To oblique: Bring the staff to a horizontal position, the head of the staff opposite the neck, the ferrule pointing in the direction the oblique is to be made; extend the arm to its full length in the direction of the staff.

To march by the right flank: Extend the arm to the right, the staff vertical, ferrule upward, back of the hand to the rear.

To march by the left flank: Extend the arm to the left, the staff vertical, ferrule upward, back of the hand to the front.

To diminish front: Let the ferrule fall into the left hand at the height of the eyes, right hand at the height of the hip.

To increase front: Let the ferrule fall into the left hand at the height of the hip, right hand at the height of the neck.

The **march**, **flourishes**, or **ruffles**: Bring the staff to a vertical position, hand opposite the neck, back of the hand to the front, ferrule pointing down.

To the colors: Bring the staff to a horizontal position at the height of the neck, back of the hand to the rear, ferrule pointing to the left.

When the band is playing in marching, the drum major beats the time with his staff and supports the left hand at the hip, fingers in front, thumb to the rear.

The drum major, with staff in hand, salutes by bringing his staff to a vertical position, head of the staff up and opposite the left shoulder.

At a halt, when the band is not playing, the drum major holds his staff with the ferrule touching the ground about 1 inch from the toe of the right foot, at an angle of about 60°, ball pointing upward to the right, right hand grasping staff near the ball, back of the hand to the front; left hand at the hip, fingers in front thumb to the rear.

Section III.—MANUAL OF THE SWORD

To Draw Sword

6–18. The sword being sheathed: 1. **Draw**, 2. **SWORDS.**

FIG. 87.—Position at command **Draw**

FIG. 88.—Position at the command **SWORDS**

At the first command, grasp the scabbard with the left hand at the upper band, turn the guard to the front, seize the grip with the right hand, and draw the blade six inches out of the scabbard, pressing the scabbard against the thigh with the left hand. At the second command, draw the sword quickly, raising the arm to its full extent, at an angle of about forty-five degrees, the sword in a straight line with the arm, edge down, drop the left hand by the side; after a slight pause bring the back of the blade against the shoulder, the blade vertical back of the grip to the rear, the arm nearly extended, the thumb and forefinger embracing the lower part of the grip, the thumb against the thigh, the fingers joined behind the end of the hilt. This is the position of **carry.**

The Carry

6–19. The sword will always be brought to the position of **carry** when giving commands to men under arms, at the preparatory command for marching, during alignments, and at the first motion of **about face.**

Mounted Officers

6–20. Mounted officers unhook the sword before mounting, and, in the first motion of **draw swords** reach with the right hand over the bridle hand, and, without the aid of the bridle hand, draw the sword as before; the right hand, in the position of **carry**, rests on the right thigh.

FIG. 89.—Position of **carry**

FIG. 90.—Position at command **Present.** Side view

FIG. 91.—Position at command **Present.** Front view

The Sword Knot

6–21. (1) When the sword knot is worn, the right wrist may be placed in it before grasping the grip.

(2) When publishing the orders the sword is held suspended from the right wrist by the sword knot, which may be placed on the wrist before drawing the sword and taken off after returning it.

To Present or Salute

6–22. Being at the carry or order: 1. **Present.** 2. **SWORDS** (or **ARMS**).

At the first command, carry the sword to the front, point up, edge to the left, raising the hand as high as the neck and six inches in front of it, the thumb on the left of the grip, elbow close to the body, the blade inclined slightly to the front. At the second command, drop the point of the sword near the ground by extending the arm, so that the right hand may be brought to the side of the right thigh, the thumb on the left of the grip, the blade inclining downward and to the front, edge to the left.

FIG. 92.—Position at command ARMS, following Present

The Order

6–23. Being at the carry (or present): 1. **Order.** 2. **SWORDS** (or **ARMS**).

At the second command, drop the point of the sword to the front on the ground, edge down, thumb on the back of the grip, the arm hanging naturally by the side.

FIG. 93.—Position at Order

Parade Rest

6–24. Being at the order: 1. **Parade,** 2. **REST.**

At the second command, carry the right foot six inches straight to the rear, the left knee slightly bent, clasp the hands on the hilt in front of the center of the body, left hand uppermost, the sword vertical, the point on the ground between the feet, edge to the right.

General Rules

6–25. (1) The sword is held at the carry while changing position in quick time.

(2) When at the order, swords are brought to the carry when arms are brought to any position except the present or parade rest.

(3) When arms are brought to the order, the officers or enlisted men with sword drawn execute the order.

(4) Marching in double time, the sword is carried diagonally across the breast, edge to the front, right forearm horizontal; the left hand steadies the scabbard.

FIG. 94.—Position of Parade REST

FIG. 95.—Position for double time

FIG. 96.—Position SWORDS when returning swords

(5) Marching in **route step**, also when the command is not under arms, the sword remains sheathed.

(6) P. os., with swords drawn, salute by executing the first motion of **present swords**, as explained for officers. This position is also taken at inspection; when the inspecting officer passes, the wrist is turned outward to show the flat of the sword toward the face.

To Return Sword

6–26. Being at the order or carry: 1. **Return**, 2. **SWORDS.**

(1) At the first command, take the position of the first motion of **present swords**, at the same time grasp the scabbard at the upper band with the left hand and turn it, edge to the front. At the second command, lower the blade, the point describing a semicircle to the left, turn the head slightly to the left, fixing the eyes on the opening of the scabbard, insert the point, guiding it with the thumb and forefinger of the left hand; return the sword quickly, turn the guard to the rear, drop both hands by the sides, and look to the front.

(2) Mounted officers return swords without using the left hand; the sword is hooked up on dismounting.

Section IV.—THE GUIDON

6–27.—The guidon is a company emblem, its specifications prescribed and use authorized by Army Regulations. The care and use of the guidon are governed by the following general rules:

a. It is carried at ceremonies; **on other occasions it is carried only when prescribed by the commander.**

b. In garrison it is kept in the orderly room when not being carried in formation.

c. In camp between reveille and retreat, except during inclement weather and when being carried in formation, it is displayed in front of the tent of the company commander.

d. On the march the guidon is with the company baggage or left at the orderly room should the baggage not be carried.

e. In combat the guidon is always with the company baggage.

f. The guidon bearer is a specially selected enlisted man designated by the company commander.

g. **Manual of the guidon.**

(*a*) The guidon executes **present arms, parade rest**, and the **order** with the company. At the command of execution of other movements of the manual, the guidon executes the **carry.**

(*b*) *Position of carry guidon:* The lance of the guidon is held vertically in the right hand, resting in the hollow formed by the thumb and first finger, back of the hand to the right, arm extending downward, lance resting in the hollow of the shoulder, ferrule about 6 inches from the ground. The **carry** is the habitual position when troops are marching.

(*c*) Being at **carry guidon** to **order guidon.** Lower the lance to the ground so that the ferrule is on a line with and touching the toe of the right shoe, right hand grasping the lance as in the carry.

(*d*) Being at **order guidon to carry guidon.**

(1) Grasp the lance with the left hand opposite the right elbow and raise the lance 6 inches, permitting it to slide through the right hand.

(2) Cut the left hand smartly to the side and assume the position of the **carry.**

(*e*) Being at **order guidon** to execute **parade rest.** Execute parade rest as without arms, at the same time carrying the lance, without moving the position of the ferrule, to the left so that it is opposite the junction of the neck and left shoulder; hands in the same relative position as without arms.

(*f*) Being at **parade rest** to execute **order guidon.** Resume the order, cutting away the left hand from the lance when it is opposite the right hip.

(*g*) Being at **carry** or **order guidon** to execute **guidon salute (present arms).** Lower the guidon straight to the front, extending the right arm nearly horizontal until the lance, resting in the pit of the right arm, is horizontal.

When marching in review or in other ceremonies the guidon bearer salutes with the company commander and returns to the **carry** with him.

(*h*) Being at **guidon salute** to **carry** or **order guidon.**

(1) Grasp the lance with the left hand, palm up, at a point just beyond the right hand.

(2) Quit the lance with the right hand, which is immediately dropped to the side; at the same time with the left hand carry the guidon up and back so that the lance rests in the hollow of the shoulder.

(3) Grasp the lance with the right hand, cut away the left hand to the side, and assume the position of **carry** or **order.**

Chapter 7

PHYSICAL DRILL WITH ARMS

NOTE.—From the Manual of Physical Drill by Chaplain W. O. Holway, United States Navy. From Ship and Gun Drills, 1905.

7–1. General rules.—(1) All movements in this section are in four counts and, except "Coming to ready," are performed two (or four) times.

(2) The exercises may be executed by command, or to music, or silently, following the motions of a leader, and may be discontinued by the command **HALT**, when the "**ready**" will be resumed.

(3) Take intervals or distances as prescribed in the drill regulations. (Arts. 3–8 and 3–9.)

FIG. 97.—Coming to ready. First position

FIG. 98.—Coming to ready. Second position

FIG. 99.—Coming to ready. Third position

Coming to ready.—Commands: **Come to ready**—1, 2, 3. (Figs. 97, 98, 99.)

1. Raise the piece with the right hand, grasp it with the left at the height of the right shoulder, knuckles toward the body. The right hand will grasp the small of the stock, forefinger under the guard.

2. Let the piece drop in front of the body to a horizontal, slings down, keeping the body erect.

3. Raise the piece horizontally to the height of the shoulders, slings up, at the same time moving the left foot to the left about 12 inches. Keep the chest out and the shoulders well back. This position is **ready**, and is the starting point of all the movements under arms.

7–2. First exercise—down and forward.—SPECIAL ACTION.—The muscles of the hips, back, and arms. Commands: **Down and forward**—1, 2, 3, 4; 1, 2, 3, 4, etc. (Figs. 100 and 101.)

1. From **ready** lower the piece horizontally to the insteps, keeping arms and knees (if possible) straight.
2. Back to **ready**, chest out, elbows back.
3. Push piece horizontally forward.
4. Back to **ready**.

FIG. 100.—Down and forward. End of first count

FIG. 101.—Down and forward. End of third count

7–3. Second exercise—forward and up.—SPECIAL ACTION.—The muscles of the arms and of side walls of the chest.

Commands: **Forward and up.**—1, 2, 3, 4; 1, 2, 3, 4. (Fig. 102.)

1. From **ready,** push out horizontally forward as in the last exercise.
2. Back to **ready,** chest out, elbows back.
3. Push the piece to high vertical, keeping it horizontal, and expanding chest.
4. Back to **ready.**

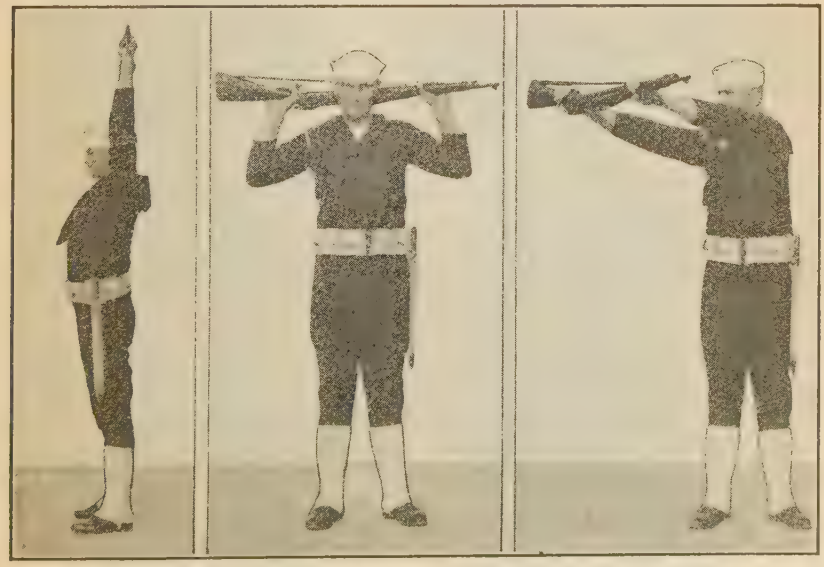

FIG. 102.—Forward and up. End of third count

FIG. 103.—Up and shoulders. End of second count

FIG. 104.—Side pushes. End of first count

7-4. **Third exercise—up and shoulders.**—SPECIAL ACTION.—The muscles of the arms and of the side and front walls of the chest.

Commands: **Up and shoulders**—1, 2, 3, 4; 1, 2, 3, 4. (Fig. 103.)

1. From **ready**, push the piece to vertical, as in last exercise.
2. Lower piece to back of shoulders, head up, elbows well back.
3. Up again to vertical.
4. Down to **ready**.

7-5. **Fourth exercise—side pushes.**—SPECIAL ACTION.—The rotary muscles of the body and thighs; the loin muscles.

Commands: **Side pushes**—1, 2, 3, 4; 1, 2, 3, 4. (Fig. 104.)

1. From **ready**, push the piece horizontally to right side, twisting the body, keeping the eyes on the piece but keeping the heels firmly on the ground.
2. Back to **ready**, chest out, elbows back.
3. Push the piece to the left side.
4. Back to **ready**.

FIG. 105.—Diagonal lunges. End of first count

FIG. 106.—Forward lunges. End of first count

7-6. **Fifth exercise—diagonal lunges.**—SPECIAL ACTION.—The muscles of the arms, back, and legs.

Commands: **Diagonal lunges**—1, 2, 3, 4; 1, 2, 3, 4. (Fig. 105.)

1. From **ready**, lunge diagonally to the right, about 36 inches, with the right leg, at the same time bringing the piece up horizontally to 45°. The left foot should be flat and the eyes directed to the piece.
2. Back to **ready**, chest out, elbows back.
3. Lunge to the left with left leg, as above.
4. Back to **ready**.

7-7. **Sixth exercise—forward lunges.**—SPECIAL ACTION.—The muscles of the arms and legs and the side walls of the chest.

Commands: **Forward lunges**—1, 2, 3, 4; 1, 2, 3, 4. (Fig. 106.)

1. From **ready**, lunge directly to the front, about 36 inches, with the right leg, at the same time raising piece horizontally to vertical and directing the eyes to the piece. Keep left foot flat.
2. Back to **ready**.
3. Lunge to the front with left leg, as above.
4. Back to ready.

FIG. 107.—Front sweeps

FIG. 107a.—Front sweeps. End of second count

7-8. Seventh exercise—front sweeps.—SPECIAL ACTION.—All the principal posterior muscles of the body.

Commands: **Front sweeps, slow**—1, 2, 3, 4; 1, 2, 3, 4. (Fig. 107.)

1. From **ready**, raise the piece horizontally to high vertical, keeping the chest well out and emphasizing the up-stretch.
2. Lower the piece slowly in front semicircle to insteps, keeping the arms straight and emphasizing the out-reach.
3. Raise the piece slowly in front semicircle to vertical.
4. Down to **ready**.

FIG. 108.—Overhead twist. Butt front

FIG. 109.—Overhead twist. Muzzle front

7–9. Eighth exercise—overhead twists.—SPECIAL ACTION.—The rotary muscles of the upper part of the body; also stimulates the venous circulation.

Commands: **Overhead twists, butt front.**—1, 2, 3, 4; **muzzle front**—1, 2, 3, 4. (Figs. 108–109.)

1. From **ready**, raise the piece overhead, at the same time twisting it till the butt points directly forward. Keep the piece horizontal.
2. Twist the piece to the right until the muzzle points directly forward. Hold the hips firmly forward, confining the movement to the upper part of the body.
3. Twist back till the butt points directly forward.
4. Lower the piece to **ready.**
1. From **ready** raise the piece overhead, at the same time twisting it till the muzzle points directly forward.
2. Twist the piece to the left until the butt points directly forward.
3. Twist back until the muzzle points forward.
4. Lower the piece to **ready.**

FIG. 110.—Side twist. End of second count

FIG. 111.—Side twist. End of fourth count

7–10. Ninth exercise—side twists.—SPECIAL ACTION.—The muscles of the sides, loins, and small of the back.

(1) Commands: **Side twists**—1, 2, 3, 4; 1, 2, 3, 4. (Figs. 110 and 111.)

1. From **ready**, drop the piece horizontally in front to position No. 2 in **coming to ready.**
2. Lifting the butt up, carry the piece strongly to the left side and out, muzzle pointing directly down. Keep the hips firm.
3. Return the piece to position No. 2 in **coming to ready.**
4. Lifting the muzzle, carry the piece strongly to the right side and out, muzzle pointing directly up.

(2) Repeat the exercise.

(3) At the end of the ninth exercise, come to **order arms.**

Chapter 8

DRILL AND COMBAT SIGNALS

Section I.—INTRODUCTION AND GENERAL RULES

8–1. Purpose of signals.—Signals are for the purpose of transmitting commands when the transmission will be in a simpler, more direct, and more efficient manner than would be possible by the use of the voice.

8–2. Kinds of signals employed.—Signals may be by whistle, by arm-and-hand, and by flag as prescribed herein.

8–3. Whistle signals.—Whistle signals will be made with the whistle prescribed for the leader or commander concerned.

8–4. Arm-and-hand signals.—*a.* In making arm-and-hand signals, either arm and hand may be used, unless specifically stated otherwise.

b. When possible, the signals will be commenced with the hand at the side and will be completed by its return to that position.

c. Signals must be plainly visible to those concerned in their execution.

d. If a movement is to be executed by an integral part of a command, the signal designating the unit or units will be given before the signal for the movement.

e. Signals made up of two or more elements will be avoided unless the component parts are easily recognized. They should never be used when a single signal will serve the same purpose.

f. On the firing line, or in drills simulating firing-line conditions, leaders will "repeat back" at once each signal received.

Section II.—WHISTLE SIGNALS

8–5. Attention to orders.—Sound a *short blast* of the whistle. The signal is used to fix the attention of troops, or of their commanders and leaders, preparatory to giving commands, orders, or signals.

When in charge of a portion of the firing line, each squad leader will fix his attention upon his platoon or section leader for signals at the short blast of a whistle. If the squad leader's attention is attracted by a whistle other than that of his platoon or section leader, or if he receives no orders or commands to give to his squad, he will return his full attention to his squad or group at once.

8–6. Suspend firing.—Sound a *long blast* of the whistle. This signal will be verified at once by an arm-and-hand signal or by other means.

8–7. Limitation as to number of whistle signals.—Whistle signals other than the two given above are prohibited.

Section III.—GENERAL ARM-AND-HAND SIGNALS

8–8. Forward, march; by the right (left) flank, march; to the rear, march.—Face and move in the desired direction of march; at the same time extend the hand vertically to the full extent of the arm, palm to the front, and lower the arm and hand in the direction of movement until horizontal.

8–9. Halt.—Carry the hand to the shoulder, palm to the front; then thrust the hand upward vertically to the full extent of the arm and hold it in that position until the signal is understood.

8–10. Lie down; or, take cover—Turn toward the unit or group and raise the hand, palm down, in front of the elbow, forearm horizontal; thrust the hand downward and back to this position several times, holding the wrist rigid.

8–11. Double time, march; or, rush.—Carry the hand to the shoulder, fist closed; rapidly thrust the fist upward vertically to the full extent of the arm and back to the shoulder several times.

8–12. Quick time, march.—Raise the elbow to a position above and to the right (left) of the shoulder and extend the forearm to the left (right), hand above the head, palm to the front.

8–13. Change direction, march.—Carry the hand that is on the side toward the new direction across the body to the opposite shoulder and, with the palm down and the forearm horizontal, swing the forearm in a horizontal plane, extending the arm and hand to point in the new direction.

8–14. As skirmishers, march.—Raise both arms laterally until horizontal, arms and hands extended, palms down. If it is necessary to indicate direction of march, signal **Forward march**, moving at the same time in the desired direction.

8–15. As skirmishers, right (left), march.—Raise both arms laterally until horizontal, arms and hands extended, palms down; swing the arm and hand on the side toward which the deployment is to be made, upward until vertical and back immediately to the horizontal position; repeat swinging movement several times; hold the other arm and hand steadily in the horizontal position until the signal is to be completed.

8–16. Assemble, march.—Raise the hand vertically to the full extent of the arm, fingers extended and joined, and describe large horizontal circles with the arm and hand.

8–17. Range; or, change elevation.—Announce the range by extending the arm fully toward the leader or men for whom the signal is intended, with the fist closed; open the fist, exposing the palm and fingers to the leaders or men, once for 500 yards, twice for 1,000 yards, and so on; move the fist upward, wrist rigid, and back to the range announcing position once for each 100 yards up to 500 and for each additional 100 yards above 500 or the multiples of 500; describe a short horizontal line with the arm, fist closed, to add 50 yards. Change elevation by indicating the complete new range.

8–18. Are you ready? or, I am ready.—Extend the arm toward the leader for whom the signal is intended, hand raised, fingers extended and joined, palm toward the leader.

8–19. Commence firing.—Extend the arm and hand horizontally in front of the body to their full extent, palm of the hand down; move them several times through a wide horizontal arc.

8–20. Fire faster.—Execute rapidly the signal **Commence firing.** For machine guns, a change to the next higher rate of fire is required.

8–21. Fire slower.—Execute slowly the signal **Commence firing.** For machine guns, a change to the next lower rate of fire is required.

8–22. New target.—Extend the arm and hand to the front, palm of the hand to the right (left); swing them to the right (left) to point in the direction of the new target.

8–23. Suspend firing.—Raise the forearm to a horizontal position in front of the forehead, palm of the hand to the front; hold the forearm steady until the signal is understood.

8–24. Cease firing.—Raise the forearm as in **Suspend firing** and swing it up and down several times in front of the face.

8–25. Section.—Extend the arm and hand toward the section leader, palm of the hand down, and describe large vertical circles with them.

8–26. Squad.—Extend the arm and hand toward the section leader, palm of the hand down; distinctly move the hand up and down several times from the wrist, holding the arm steady.

8–27. Section or squad column.—Execute the signal for **Section** or **Squad**; drop the arm and hand to the side and immediately swing them, extended, in a pendulum movement straight to front, not higher than the shoulder and back again to the side.

8–28. Fix bayonet.—Simulate the movement of the right hand in executing **Fix bayonet.**

8–29. Assault fire.—Extend the arm and hand to the front, palm of the hand up; move them upward, describing an arc of about 45°; then signal **Forward march.**

Section IV. ADDITIONAL ARM-AND-HAND SIGNALS FOR MACHINE-GUN COMPANIES

8–30. Action.—Thrust the fist several times in the direction toward which it is desired to go into action.

8–31. Echelon formation.—Face the unit for whom the signal is intended; extend both arms horizontally to the front, fists closed with the knuckles up; withdraw either fist halfway toward the body by flexing the arm at the elbow.

8–32. Off carts.—Face the unit for whom the signal is intended; raise the elbow laterally to the height of the shoulder and touch the shoulder with the fingers.

8–33. On carts.—Face the unit for whom the signal is intended; raise the elbows laterally to the height of the shoulders and touch the shoulders with the fingers.

8–34. Out of action.—Strike the closed fist of one hand rapidly against the open palm of the other several times.

Section V.—SPECIAL SIGNALS FOR SCOUTS, OBSERVERS, AND PATROLS

8–35. Dangerous locality.—Signal **Double time march** and point in the direction of the probable hostile position. This signal will indicate to the leader that the area where the scout then is is considered dangerous ground and should be avoided or passed over quickly.

8–36. Enemy in sight in small numbers.—Hold the weapon horizontally above the head with the arm or arms extended as if guarding the head.

8–37. Enemy in sight in large numbers.—Hold the weapon as explained in paragraph 8–36; lower and raise it several times by flexing the arm or arms at the elbow.

8–38. More time needed for reconnaissance.—Signal **Halt.** The signal will indicate to the leader that the scout needs more time for reconnaissance. The leader acts as he deems necessary.

Section VI.—COMBAT SIGNALS

8–39. For communication between the firing line and the reserve or commander in rear, the subjoined signals (Signal Corps codes) are prescribed and should be memorized. In transmission, their concealment from the enemy's view should be insured. In the absence of signal flags, the headdress or other substitute may be used.

Letter of alphabet	If signaled from the rear to the firing line	If signaled from the firing line to the rear
A M	Ammunition going forward	Ammunition required.
C C C	Charge (mandatory at all times)	Am about to charge if no instructions to the contrary.
C F	Cease firing	Cease firing.
D T	Double time or "rush"	Double time or "rush" or hurry.
F	Commence firing	Commence firing.
F L	Artillery fire is causing us losses	Artillery fire is causing us losses.
G	Move forward	Preparing to move forward.
H H H	Halt	Halt.
N	Negative	Negative.
L T	Left	Left.
I (R N, etc.) (Semaphore only.)	What is the (range, etc.)? Interrogatory.	What is the (range, etc.)? Interrogatory.
• • — — • • (R N, etc.) (Flash and wigwag.)	What is the (range, etc.)? Interrogatory.	What is the (range, etc.)? Interrogatory.
A	Affirmative	Affirmative.
R	Acknowledgment	Acknowledgment.
R N	Range	Range.
R T	Right	Right.
S S S	Support going forward	Support needed.
T	Target	Target.

Chapter 9

EXTENDED ORDER, THE RIFLE SQUAD, SECTION, AND PLATOON

Section I.—INTRODUCTION

9–1. Purpose of extended order drills.—The purpose of extended order drills is—

a. To teach the leaders and members of small units the mechanism of deployment and movement utilized in combat exercises and actual combat.

b. It requires the leaders to see quickly what is to be done and to order it without hesitation; it requires the men to execute the order rapidly without losing their cohesion.

c. To give the leaders a method of employing their troops to meet tactical situations arising in combat.

9–2. General rules.—*a.* Extended order drill is executed at ease.

b. The platoon is the largest unit which, by formal commands, executes extended order drill.

c. Signals are freely used during instruction, in order that officers and men may readily know them.

d. In extended order, during real or simulated firings, squad leaders and, if necessary, individual men transmit orders by word of mouth along the firing line. Transmission of orders by this means requires special training.

9–3. General rules for loadings and firings.—*a.* The commands for loading and firing are the same whether standing, kneeling, sitting, or lying down.

b. Rifles, having been ordered loaded, are kept loaded without command until the command **Unload** or **Inspection arms**, fresh clips being inserted when the magazine is exhausted.

c. The aiming point or target is carefully pointed out. This is habitually done after announcing the sight setting. Both are indicated before giving the command for firing. The designation of the target may be omitted when the target appears suddenly and is unmistakable, but the range must always be announced, the command **Battle sight** being given when it is not desired to have the sight set.

d. The command for range serves as a preparatory command for firing; it insures the simultaneous opening of fire and the full effect of surprise.

e. The target or aiming point having been designated, such designation need not be repeated until a change is necessary.

f. Troops are trained to continue their fire upon the aiming point or target designated until a change is ordered.

g. If the men are not already in the position of load, that position is taken at the announcement of the range. Skirmishers not in a firing position, either at a halt or in movement, takes such position at the command announcing the range.

h. A skirmish line may load while moving, the pieces being held as nearly as practicable in the position of load.

9–4. To set the sight.—Being in any firing formation: **RANGE, SIX HUNDRED (THREE FIFTY, EIGHT HUNDRED,** etc.) or **BATTLE SIGHT.** The sight is set as ordered.

9–5. To fire at will.—*a.* Being in any firing formation: **FIRE AT WILL.** Each man, independently of the others, comes to the ready, aims carefully and deliberately at the aiming point or target, fires, reloads, and continues firing until ordered to suspend or cease firing.

b. To fire a designated number of rounds: 1. **Two (one, five,** etc.) **rounds,** 2. **FIRE AT WILL.** Each man fires the designated number of rounds, reloads, and holds the rifle in a position of readiness.

c. To increase (decrease) the rate of fire in progress, the instructor commands: **FASTER (SLOWER).**

9–6. To suspend firing.—*a.* The instructor blows a long blast of the whistle and repeats it if necessary or commands: **SUSPEND FIRING.**

Firing stops; rifles are held loaded and locked in a position of readiness for instant resumption of firing, sights unchanged. The men continue to observe the target or aiming point, or place at which the target disappeared, or at which it is expected to reappear. Suspend firing is used for short pauses or to steady the men.

b. This whistle signal may be used as a preliminary to **Cease firing.**

9–7. To cease firing.—*a.* **CEASE FIRING.** Firing stops; rifles not already there are brought to the position of load; those not loaded are then loaded; sights are laid and rifles are locked and brought to the order.

Cease firing is used for long pauses to prepare for changes of position.

b. Commands for suspending or ceasing fire may be given at any time after the preparatory command for firing whether the firing has actually commenced or not.

9–8. Instructions for use of the bayonet.—*a.* The bayonet is fixed at any time when so ordered.

b. If marching, kneeling, or lying down, the bayonet is fixed and unfixed in the most expeditious and convenient manner and the rifle returned to the original position. Fix and unfix bayonet are executed with promptness and regularity but not in cadence.

Section II.—INSTRUCTION OF THE RIFLE SQUAD AND SKIRMISHER

9–9. To deploy as skirmishers.—*a.* (1) Being in any formation, assembled; **1. As skirmishers (so many paces), 2. MARCH**

(2) The squad leader places himself in front of the squad, if not already there. Moving at a run, the men place themselves abreast of the squad leader at the designated interval. Nos. 1 and 2 on his right, Nos. 3 and 4 on his left, rear-rank men on the right of their file leaders, extra men on the left of No. 4; all then conform to the squad leader's gait. If no interval is designated, the men deploy at 5-pace intervals.

(3) When the squad is acting alone, the deployment is similarly made on No. 2 of the front rank, who stands fast or continues the march as the case may be; the squad leader places himself in front of the squad when advancing and in rear when halted.

(4) When deployed as skirmishers, the men march at ease, pieces at the trail unless otherwise ordered.

(5) The squad leader is the guide when in line; otherwise No. 2 of the front rank is the guide.

b. The interval between skirmishers depends upon the tactical situation.

c. If marching to the rear, skirmishers resume the march to the front by the command: **1. Forward, 2. MARCH.**

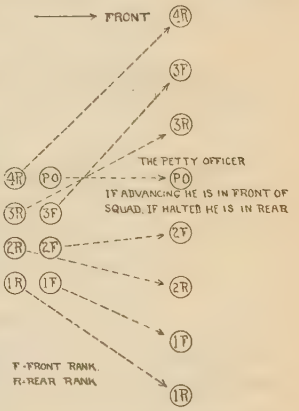

FIG. 112.—To deploy as skirmishers

d. If deployed, to increase or diminish the interval: **1. As skirmishers (so many paces), 2. MARCH.** The men move by the flank toward or away from the guide until the new intervals are obtained.

9–10. To follow the squad leader.—*a.* Being in any formation, to march the squad without unnecessary commands, the squad leader places himself in front of the squad and commands: **FOLLOW ME.**

b. If in line or deployed as skirmishers, No. 2 of the front rank follows in the trace of the squad leader at about 3 paces; the other men conform to the movements of No. 2, guiding on him and maintaining their relative positions.

c. If in column, the head of the column follows the squad leader.

9–11. The assembly.—*a.* Being deployed: **1. Assemble, 2. MARCH.**

b. The men move toward the squad leader in double time and form in their proper places.

c. If the squad leader continues to advance, the squad follows him at 3 paces.

d. The assembly is not executed while marching to the rear.

9–12. To kneel or lie down.

a. To kneel: **KNEEL.** Assume the kneeling firing position, except the left forearm is across the left thigh; rifle remains in position of order, right hand grasping it above the lower band.

b. Being at a halt, quick time, double time, or running; to lie down: **DOWN.**

(1) Advance the left foot, turning it across the front of the body.

(2) Drop forward on the outside of the left knee and at the same time extend the rifle, grasped in both hands and held vertically, so that the butt strikes the ground at full arm's length directly in front of the left knee.

(3) Pivoting on the left knee and the butt of the rifle, roll forward into the firing position, with the rifle at the shoulder, or into the prone position, with the rifle on the ground to the front.

(4) To kneel or lie down with the automatic rifle is executed according to the same principles as with the rifle.

c. When without the rifle, advance the left foot as above. Extend the left arm over the head and roll forward on to the left knee, the left hip, and the left shoulder into the prone position. Care should be taken that the hands do not get under the body. In the prone position, the body is flat on the belly, the left side of the face on the ground, legs extended and apart with heels down, arms to the front and flat on the ground. The piece, if carried, is held to the front grasped in the right hand.

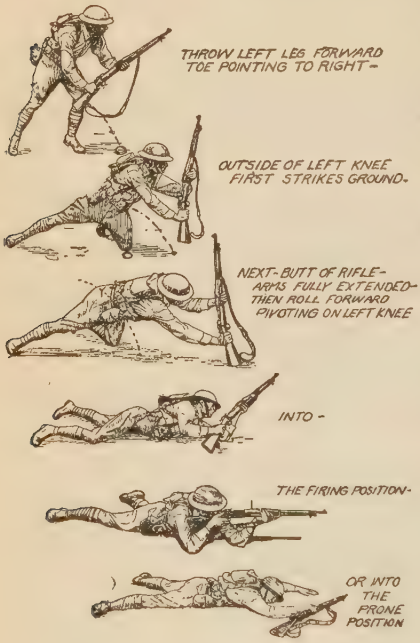

FIG. 113.—To lie down

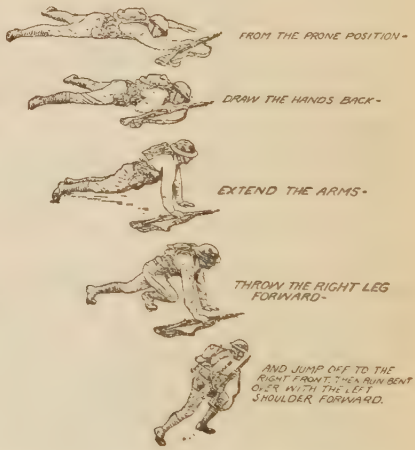

FIG. 114.—If lying down, to move forward at a run

d. In *lying down,* those required to fire or simulate firing drop to the firing position, others to the prone position.

e. If lying down, to move forward at a run: 1. **Cease firing,** 2. **Prepare to rush,** 3. **UP** or **FOLLOW ME** (or other command requiring a move forward at a run).

(1) If in the firing position, first take up the prone position and then draw the arms in slowly until the hands are opposite the chin, elbows away from the body and down.

(2) Raise the body by straightening the arms.

(3) Throw the weight of the body to the left arm and leg, and bringing the right leg forward jump off to the right front. When running, bend as low as possible, keeping the left shoulder forward. Grasp the rifle in both hands, left hand at the balance, right hand at the small of the stock

(4) To move forward other than at a run from the position of lying down, the movement is similarly executed at the appropriate command: 1. **Forward,** 2. **MARCH.**

f. If kneeling or lying down, to stand up: **RISE.**

If kneeling, stand up, face to the front, on the ground marked by the left heel in the same manner as described for **Up.**

If lying down, raise the body on both knees: stand up, face to the front, on the ground marked by the knees.

g. If lying down: **KNEEL.**

Raise the body on both knees; take the position of kneel.

The prone position is the usual position of the skirmisher when in skirmish line and when not advancing. When firing, the prone position is used to better utilize cover. The sitting or kneeling position may be used in firing when necessary to obtain a better field of fire.

9–13. Instruction of the skirmisher.—*a. Use of the rifle.*—The instruction of the recruit in the use of the rifle begins at an early period in his training. It is impressed upon him that the rifle and automatic rifle are his principal weapons and the object of all movement is to place him at such point that he can make effective use of them.

b. The use of cover.—(1) The skirmisher should be given careful instruction in the individual use of cover.

It is impressed upon him that in taking advantage of natural cover he must be able to fire easily and effectively upon the enemy. If advancing on an enemy, he must do so steadily and as rapidly as possible. He must conceal himself as much as possible while firing and while advancing. While setting his sight he should be under cover or lying prone. To teach him to fire easily and effectively, at the same time concealing himself from the view of the enemy, he is practiced in simulated firing in the prone, sitting, and kneeling positions from behind hillocks, trees, heaps of earth or rocks, and from depressions, gullies, ditches, doorways, or windows. He is taught to fire around the right side of his concealment whenever possible, or, when this is not possible, to rise enough to fire over the top of his concealment. He is taught to improve natural cover and adapt it as a firing position by the use of the intrenching tool.

When these details are understood, he is required to select cover with reference to an assumed enemy and to place himself behind it in proper position for firing. Rapid loading, rapid and accurate sight setting, and quick and skillful occupation of the firing position are practiced.

The skirmisher is instructed in the value of the different forms of cover as protection from both terrestrial and aerial view and from high-angle infantry and artillery fire.

(2) The evil of remaining too long in one place, however good the concealment, is explained. He is taught to advance from cover to cover, selecting cover in advance before leaving his concealment. It is impressed upon him that a man running rapidly toward an enemy furnishes a poor target. He is trained in springing from a prone position behind concealment, running at top speed to cover and throwing himself behind it. He is also practiced in advancing from cover to cover by crawling or by creepig.

He is instructed in moving on designated direction points, making use of cover to screen his movements without losing the direction of advance.

(3) He is taught that when fired on while acting independently, he should drop to the ground, seek cover, and then endeavor to locate the enemy.

(4) The skirmisher is taught that when acting as a member of a fire unit, should he find himself on ground unsuitable for firing because of lack of visibility or poor cover, he at once moves to the nearest favorable locality, avoiding, however, such extensive changes as would blanket the fire of others.

(5) The instruction of the skirmisher in the use of cover is continued in the combat exercises of the platoon, but he must then be taught that the proper advances of the platoon and the effectiveness of its fire are of greater importance than the question of cover for individuals.

c. Observation.—(1) The ability to use his eyes accurately is of great importance to the soldier. The recruit is trained in observing his surroundings from positions and when on the march.

He is practiced in pointing out and naming military features of the ground; in distinguishing between living beings; in counting distant groups of objects or beings; in recognizing colors and forms; and in the varying visibility of targets as affected by background and light.

(2) In the training of men in the mechanism of the firing line they are practiced in repeating to one another target and aiming-point designations and in quickly locating and pointing out a designated target. They should be taught to distinguish, from a prone position, distant objects, particularly troops, both with the naked eye and with field glasses. Similarly they should be trained in estimating distances.

d. Night movements.—(1) Movements at night or in heavy fog require special practice.

Order, silence, and skill in maintaining direction are the principal requisites. Practice is had in accustoming the eye and ear to the different impressions which

objects and sounds make under night conditions. Estimation of distance by eye and of direction and distance of sounds is practiced.

Exercises are conducted in orientation by means of objects whose location has been observed during the day, by the stars, and by the use of the compass. The soldier is instructed as to the conduct to be observed in case the enemy sets up flares in his vicinity. He is taught to secure his arms and equipment so that they make no noise.

(2) By the use of colored glasses night conditions may be simulated during daylight hours. This procedure has an advantage in that it permits the instructor to observe closely the movements of the men under instruction.

e. Special instruction.—The soldier is instructed in the passage of obstacles, wire cutting, and the laying out of panels.

Section III.—RULES FOR THE DEPLOYMENT OF THE RIFLE SECTION AND PLATOON

9–14. The terms "section" and "platoon."—The terms "section" and "platoon" as hereinafter used mean the rifle section and rifle platoon.

9–15. Formations prior to deployment.—All deployments are executed from column of squads, twos, or files, or from section or squad columns.

9–16. Direction of deployment.—*a.* The platoon and section are so instructed that they are able to deploy in any direction in silence and in order.

b. The direction may be designated prior to deployment at the same time as the command for deployment or after completion of the deployment. The direction may be indicated by designating a prominent point of the terrain (e. g., windmill, building, lone tree) or by signal. If the deployment is to be made in a direction varying greatly from the direction of the advance, the platoon changes direction before deploying. If no direction be designated, the platoon or section deploys straight to the front. Where an advance is to take place on assigned direction lines for long-continued periods, a distant direction point and compass bearing are designated after deployment.

9–17. Base of deployment.—The leading squad is the base of deployment. It remains the base of movement after deployment, unless another squad is designated by the platoon leader. In the base platoon of the company, the center squad of the leading wave is ordinarily designated as the base of the platoon; in other platoons the base squad is as a rule the squad on the flank toward the base platoon of the company.

9–18. Alignment and interval.—Deployed platoons preserve a general alignment toward, and maintain interval from, the base squad within their respective fronts; individuals or squads march so as best to secure cover or facilitate the advance. Where distant direction points and compass bearing have been designated, each platoon marches in the designated direction. Any discrepancy in direction is, however, adjusted on the base platoon. Where it is impracticable to assign direction lines for long periods in advance, as will ordinarily be the case in mobile situations, both intervals and progress are adjusted on the base platoon.

9–19. Use of signals.—*a.* Except in case of darkness or heavy fog, platoon and section leaders deploy, assemble, and maneuver their units as far as practicable by arm signals.

b. Whistle signals are sparingly used. When employed preliminary to a command during the advance into action they give warning to the enemy of our approach, and when used to initiate a rush in the presence of the enemy, they betray to him the fact that a movement is about to commence. In general, their use is limited to movements during the fire fight when on account of the noise of battle it is impossible to attract the attention of the skirmishers by other means.

c. The habitual use of the whistle as a preliminary to a command is prohibited.

9–20. Commands.—*a.* A deployed platoon or section *advances*, *halts*, moves *by the flank* or *to the rear*, *obliques*, resumes *the direct march*, passes from *quick* to *double time* and the reverse by the same commands and in a similar manner as in close order; if at a halt, the movement *by the flank* or *to the rear* is executed by the same commands as when marching. Changes in the direction of march are usually effected by the assignment of a new march direction to the base squad; skirmishers place themselves on the new front by gradual obliques and by opening out from or closing in on the base.

b. Movement may be interrupted by the commands **HALT, DOWN, RANGE.** On halting, a deployed line faces to the front (direction of the enemy) in all cases. If halted by the command **DOWN**, skirmishers take cover; if halted by the

command **RANGE** (or **BATTLE SIGHT**), they occupy a position on an approximate line with the platoon leader, take cover, and place themselves in readiness for instant firing.

9–21. Posts of leaders, guides, and runners.—Leaders, guides, and runners are not tied to fixed posts. In general the following will govern:

a. When the platoon is in movement, the platoon leader is on the side of the platoon toward the enemy. When the platoon is halted in a firing position he directs the platoon from a position in rear of its leading section, or if both sections are in one line his position will be in rear thereof; when otherwise halted he remains in front of his platoon. The post of the platoon p. o. is in rear of the center of the leading wave. During forward or flank movements section leaders are on the side of the sections toward the enemy. During movements to the rear they are on the side opposite the enemy. When the sections are halted in a firing position they are in rear of their sections. When otherwise halted they are in front of their sections.

b. Section guides are on the side of their sections opposite the enemy, generally near the center of their sections.

c. At the command for deployment, runners join the platoon leader; when the platoon deploys as an element in the combat formation, one runner joins the company commander.

9–22. Scouts.—All members of the squad are trained as scouts. In each squad, numbers one front rank and rear rank act as scouts. Scouts are instructed to work in pairs.

9–23. Assembly formation.—The assembly formation is always column of squads unless otherwise directed by the platoon leader.

Section IV.—DEPLOYMENT OF THE RIFLE SECTION AND PLATOON

9–24. To deploy as skirmishers.—*a.* Being in column of squads, twos, or files, or section columns, to deploy as skirmishers: 1. **As skirmishers,** 2. **MARCH.**

b. The squad leader of the leading squad moves in quick time straight to the front or in the direction indicated by the platoon leader. The leading squad deploys abreast of its squad leader. The center and rear squads of the leading section deploy abreast of the leading squad, the center squad on its right, and the rear squad on its left, men running individually toward their places on the line as soon as disengaged from column. If the leading section consists of only two squads, the rear squad deploys on the right of the leading squad.

c. The rear section deploys abreast of its leading squad and parallel to the line of the leading section as described for that section, the leading squad deploying in place. Unless otherwise directed by the platoon leader, the rear section moves to the rear a distance of approximately 50 paces from the leading section. If the platoon advances, the rear section halts and allows the leading section to gain the distance of approximately 50 paces and then takes up the advance, modifying its distance as required by considerations of cover.

d. The platoon p. o., section leaders, guides, and runners take their prescribed posts.

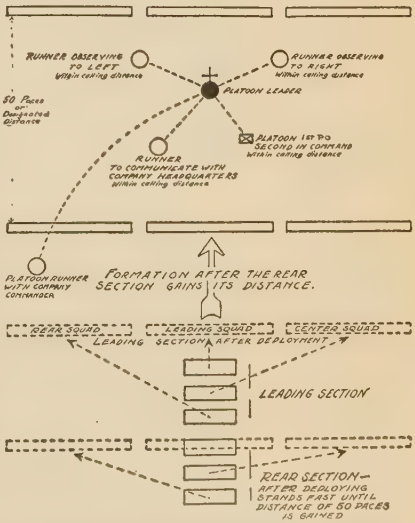

FIG. 115.—Platoon being in column of squads to deploy as skirmishers

e. Scouts of the leading section move forward a specially designated distance to a specially designated line in front of their sections when the platoon leader directs "Scouts out."

f. Squads may be deployed on one flank only of the leading squad of each section by the command: 1. **As skirmishers, right** (**left**), 2. **MARCH.** Executed as above described, except that in each section the squads in rear of the leading squad of the section deploy on the right and abreast of the leading squad of the section, in their order in column.

g. One section only may be deployed by the command: 1. **(Such) section,** 2. **As skirmishers, right (left),** 3. **MARCH.** Executed by the designated section as above described for the leading section.

h. Intervals between skirmishers are increased or decreased from or toward the base squad as described in paragraph 9–9 *d.*

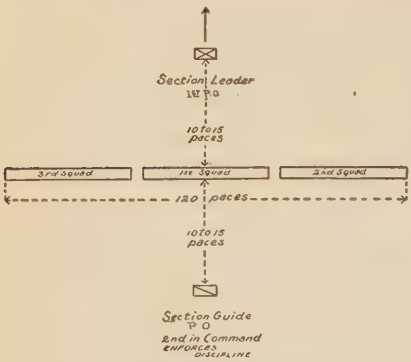

FIG. 116.—Section deployed in skirmish line and advancing. (All distances and intervals elastic)

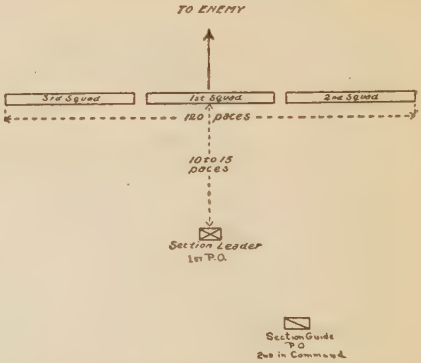

FIG. 117.—Section deployed in skirmish line and halted. (Engaged with the enemy. All distances and intervals elastic)

9–25. To deploy in line of squad columns.—*a.* Being in column of squads, twos, or files, to deploy in line of squad columns: 1. **Squad columns,** 2. **MARCH,** or 1. **Squad columns right (left),** 2. **MARCH.**

b. Executed as prescribed in paragraph 9–24, except that in each squad men follow the petty officer in left-by-file order; the second in command follows in rear of the squad; leaders of squads in rear of the leading squad of each section conduct their squads in double time to their places **abreast** of the leading squad of the section at the designated interval. If no interval is designated 40-pace intervals are taken.

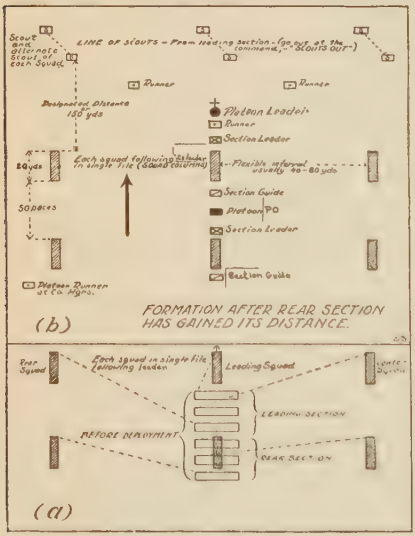

FIG. 118.—The platoon being in column of squads, twos, or file, to deploy in line of squad columns. 1. Squad columns. 2. MARCH. (All distances and intervals elastic)

c. The formation in line of squad columns may be combined with line of skirmishers by appropriate commands; example: 1. **First section, as skirmishers,** 2. **Second section, squad columns,** 3. **MARCH.**

d. Distance between men in squad columns is 5 to 10 paces.

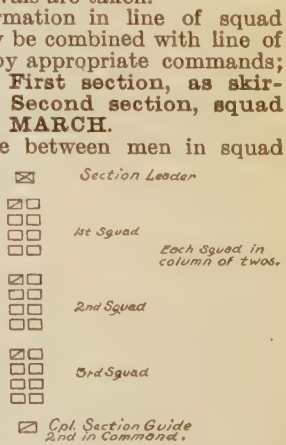

FIG. 119.—Section column. (All distances and intervals elastic)

9–26. Section columns.—Section columns are sections in column of twos; the sections are disposed with reference to each other abreast, in column with distances between sections, in echelon, or other formation required by the terrain or available cover, as directed by the platoon leader. When section or squad columns are formed in echelon or other irregular formation, they regulate their march on the most advanced unit.

Section columns may be formed from close-order formation by forming columns of twos in accordance with the principles of close order and disposing the sec-

tions in such manner as the situation may require. If the sections are to be disposed abreast, the platoon should be formed in line of sections. Distance between men in section columns is such as will permit ease in marching without straggling or unduly lengthening the column.

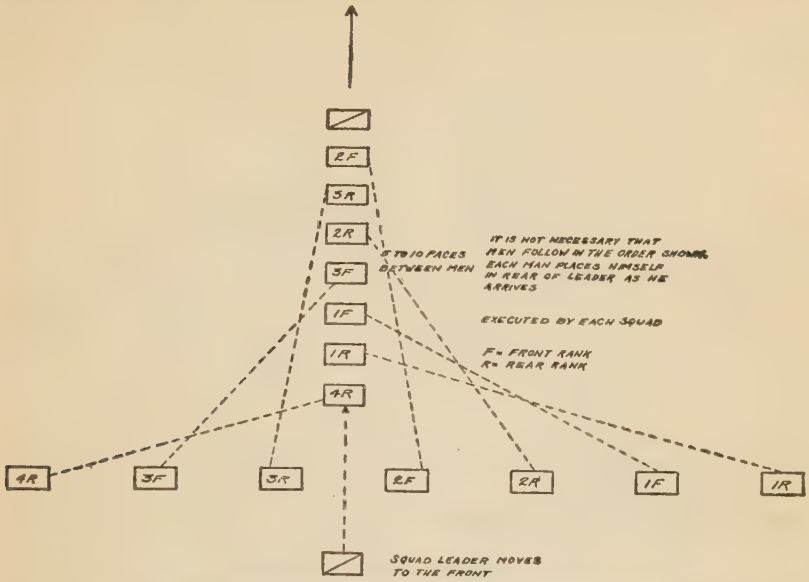

FIG. 120.—Being in skirmish line to form line of squad columns

9–27. To form line of squad columns from skirmishers.—Being deployed as skirmishers, to form line of squad columns: 1. **Squad columns**, 2. **MARCH.** Each squad leader moves to the front; the members of each squad oblique toward their squad leader, and follow him in order of arrival, in single file.

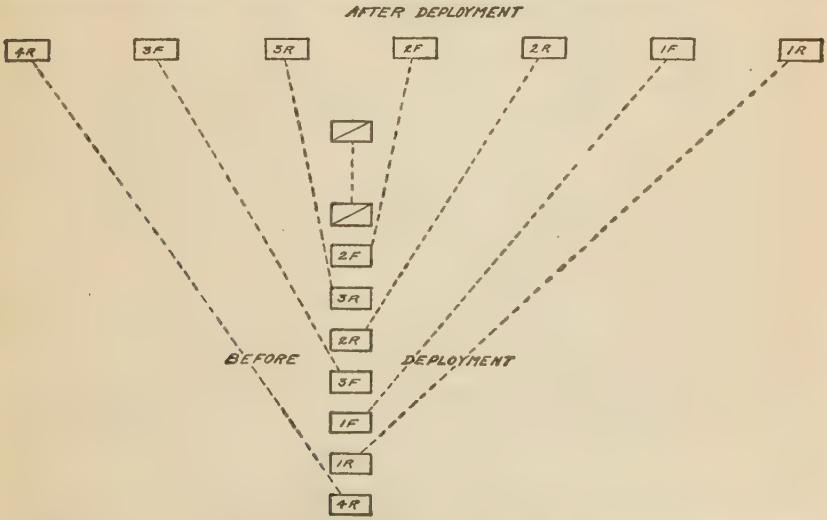

FIG. 121.—Being in line of squad columns to form line of skirmishers (executed by each squad)

9–28. To deploy as skirmishers from line of squad columns.—Being in line of squad columns, to deploy as skirmishers: 1. **As skirmishers** (so many paces), 2. **MARCH.** Each squad deploys, the skirmishers forming in the same relative order as in deployment from close-order formation.

9–29. To form section columns from skirmishers or squad columns.—Being deployed as skirmishers or in line of squad columns, to form section columns: 1. **Section columns,** 2. **MARCH.** Section leaders move forward in front of their sections, men move individually at a run toward their section leaders and assemble by squad in column of twos in his rear, squads in the same relative order as in normal formation of the section in close order, squad leaders at the head of their squads.

Section guides follow in rear of their respective sections to insure the prompt and orderly execution of the advance.

Section V.—THE ASSEMBLY

9–30. To assemble the platoon.—Being deployed as skirmishers, to assemble the platoon, the platoon leader takes post at or designates the point at which the platoon is to assemble and signals: 1. **Assemble,** 2. **MARCH.**

The platoon assembles in column of squads in the same relative order as in the normal formation of the platoon in close order (right squad in front).

The leading squad assembles at the designated point, as prescribed in paragraph 9–11. Men of other squads move individually at a run toward the assembly point, squad leaders placing themselves in their normal position in column of squads in rear of the leading squad, each squad assembling on its leader. Section leaders, guides, and runners take their prescribed posts.

If already formed in squads or sections or in squad or section columns, these are conducted to the assembly point and formed in their normal relative order by squad or section leaders.

9–31. To assemble by sections.—Sections may be assembled by the command: 1. **Sections, assemble,** 2. **MARCH.** Executed by each section as prescribed for the platoon.

9–32. To assemble by squads.—Squads may be assembled by the command: 1. **Squads, assemble,** 2. **MARCH.** Executed by each squad as described in paragraph 9–11.

9–33. To assemble one section or one or more squads.—One section or one or more squads may be assembled by the command: 1. **(Such) section (or squads), assemble,** 2. **MARCH.**

Section VI.—MOVEMENTS OF THE RIFLE SECTION AND PLATOON

9–34. To advance by rushes.—*a.* (1) Being deployed as skirmishers, to advance by rushes, the platoon leader indicates the line or cover to be reached, if practicable, and commands: 1. **By section (squad, four men,** etc.) **from the right (left),** 2. **RUSH.**

(2) The leader of the indicated fraction gives the command: 1. **Cease firing,** 2. **PREPARE TO RUSH.** The men of the fraction indicated cease firing and hold themselves in readiness to spring forward instantly, taking care not to betray to the enemy by any movement of the body or the rifle the fact that a rush is about to take place. When ready, the leader of the rush commands: **UP.** (See par. 9–12(*e*).) The leader and his men spring to their feet and, running at top speed, gain the new position, where they throw themselves on the ground (see par. 9–12(*b*)) and at the leader's commands open fire. The leader of the rush selects the new line if it has not been previously designated. Individual members of the unit make minor changes in selection of firing positions when necessary. (See par. 9–13(*b*)(4).)

(3) The first fraction having established itself on the new line, the next like fraction is sent forward by its section leader without further command of the platoon leader, and so on, successively, until the entire wave is on the line established by the first rush. The platoon leader may direct that the successive fractions execute the rush only upon his signal.

(4) The rear wave advances to the position vacated by the leading wave, or remains in its original position, or otherwise maneuvers according to circumstances, as directed by the platoon leader or on the initiative of the section leader.

(5) While leaders may accompany any fraction of the rush, they habitually accompany the last fraction. When a leader moves forward with one of the advance fractions, the second in command remains until the last fraction advances.

b. When the leading wave comprises more than one section, the rush of the wave as a whole is conducted by the platoon leader, as described for a section in subparagraph *a.*

The platoon leader leads the rush; section leaders lead their respective sections.

9–35. To advance by infiltration.—*a.* Being deployed as skirmishers, to cross open, fire-swept areas by independent advances of individuals or squads, the platoon leader commands: 1. **On (such line, e. g., crest, hedge, road,** etc.), 2. **RE-FORM.**

Each squad leader decides on the best method of reaching the designated line, whether by leading the squad as a whole along a covered route or by men working their way forward individually.

b. The platoon leader must recover control of his platoon at the designated position before attempting a further advance.

c. This method of advance finds special application at long range or when the source of hostile fire can not be discovered and beaten down.

Chapter 10

BAYONET TRAINING AND WALL SCALING

Section I.—REQUIREMENTS OF GOOD BAYONET WORK

10–1. The spirit of the bayonet.—*a.* It is an easy matter to teach the few simple technical details of bayonet combat, but an instructor's success will be measured by his ability to instill in his men the will to use the bayonet. This spirit is infinitely more than that displayed on the athletic field, and, combined with confidence in the rifle and ability to shoot, constitutes the grim determination of the firing line to close with and destroy the enemy. It is the overwhelming impulse behind every successful bayonet assault.

b. The fighting instinct of the individual must be developed to its highest point by the instructor. It first appears in a recruit when he begins to handle the bayonet with facility and increases as his confidence grows. With the mastering of his weapon there comes to him a sense of personal fighting superiority in physical conflict. He knows that he can fight and win. His practice becomes snappy and full of strength. Such a man will fight as he has trained—spiritedly and effectively. While waiting for the zero hour he will not fidget nervously. He will go over the top and win.

c. Successful training implies that men will use on the battle field what they have learned on the drill ground. To do this a man must move to the attack possessed not only of a determination to win but also of a perfect confidence in his primary arm—the rifle. Without this a bayonet assault will fail. The man who bores in at a dead run enjoys the advantage of a superior morale. The man who waits to fence loses his own nerve and helps the enemy take heart. The enemy may have the longer weapon. In that case the soldier gains the advantage by closing with his opponent but gives his opponent the advantage if he stands off and fences.

d. The growth of the spirit of the bayonet is fostered by short talks on what has already been accomplished with the bayonet.

e. The bayonet is the ultimate factor in every assault and the soldier must realize that its successful employment requires of him not only individual physical courage but also perfect discipline and a thorough knowledge of teamwork. In a bayonet fight the nerviest, best-disciplined, and most skillful man wins; the will to use the bayonet and thorough training assure success.

10–2. Continuous training.—The perfect confidence of the soldier in his weapon is born only of thorough, constant practice, which is the very essence of bayonet training.

10–3. Development of the individual.—*a.* It is vital that each man be taught to think and act for himself, and that there be no interval of time between the thinking and acting. To attain this end the men are made to use their brains and eyes to the fullest extent by carrying out the practices, so far as possible, without words of command. The instructor will cause them to parry sticks, to thrust at a shifting target as soon as it is stationary, etc. In this phase of the training the class should always work in pairs and act on the principle of master and pupil alternately. This, in itself, tends to develop individuality and confidence. Sharp, jerky words of command produce mechanical movements of the piece and should be used as little as possible. Rapidity of movement and alertness of mind are taught by various quickening exercises and games which require quick thinking and instantaneous muscular response. Boxing, wrestling, and all kinds of rough-and-tumble fighting play an important rôle in the development of the individual, and may well go hand in hand with bayonet training.

b. To attack effectively with the bayonet requires nerve, good direction, strength, and quickness during a state of extreme excitement and probable physical exhaustion. In view of this fact the individual must be brought to the highest state of physical development and kept in that condition.

In order to encourage dash and gradually strengthen the leg muscles all classes should be practiced from the beginning of the training in charging short distances, jumping trenches and hurdles, and jumping in and vaulting out of trenches.

10–4. Bayonet an offensive weapon.—It must always be remembered that the bayonet is essentially an offensive weapon. Rush straight at an opponent with the point threatening his throat and deliver the thrust wherever an opening presents itself. If no opening is obvious, one must be made by deflecting the opponent's piece or by threatening him on one side and driving in on the other. But keep boring in. The man who fails to get his thrust home when an opening presents itself for even one-fifth of a second may lose his life.

In a bayonet assault all must go forward with a determination to win.

10–5. Teamwork.—*a.* While actual bayonet combat is individual, each man must understand from the very first that he is fighting for his side and not for himself alone. It follows, therefore, that he must be familiar with the tactical employment of the bayonet. He must know not only how but when and when not to use it. For instance, it is absurd for a bayonet man to chase a retreating enemy and stab him in the back; he has a bullet in his rifle for just that situation. Again, the man who, forgetting that he is only a member of the team, rushes far ahead of his comrades is always needlessly killed, thus helping the enemy and wasting his own life. Perfect teamwork is required in the bayonet attack.

b. In both stabilized and mobile situations the bayonet man is frequently called upon to act as protector to his constant comrade, the grenade thrower. This requires that the bayonet man be familiar with the tactics of both the bayonet and the grenade in mopping-up parties, raids in either stabilized or mobile situations, in advancing through shell holes, and in assaulting waves.

c. The supreme test of a man's training is to demand of him that he hold a position at the point of a bayonet. In such cases, he must know just how to coordinate the bayonet with the other infantry weapons. He must know just what kind of a counterattack to make, and exactly when to start it.

d. Finally, there is for the instructor to consider the close relation between controlled rifle fire and the bayonet, which should be the most important phase of bayonet training.

Section II.—SPECIAL FEATURES OF BAYONET TRAINING

10–6. Signals.—*a.* The system of training herein prescribed is based on the direct appeal to the pupil's brain through his eye. In practicing the various movements, the use of signals should be started as early as practicable. Their object is to train the men to see and avail themselves instantly of openings, thus coordinating the eye with the muscles. The signals were devised to supersede the vicious practice of turning bayonet work into a drill by the use of commands, which ignores the training of the soldier's eye and deadens his initiative.

These signals are not mere imitations of the movements they call for; imitations would be of little advantage to the pupil. The idea is to indicate with the master's hand an opening which the pupil perceives and acts upon.

b. The signals, easily learned, will be used by the men working in pairs—one signaling, the other executing the movement called for.

To signal for the following positions or movements, the master will move as indicated:

(1) *Guard.*—Assume the position of guard, left hand at back, right elbow at side, right forearm pointing to front, fist closed.

(2) *Short guard.*—Same as guard, except that the arm is drawn straight to the rear until the fist is at the right side.

(3) *Long thrust.*—Clap the right palm, fingers apart and extended, to that part of the body toward which the man is to aim.

(4) *Short thrust.*—Same as long thrust, except that the fist is closed. If the man with the bayonet is not in the position of short guard or withdrawal from long thrust when he gets the signal, he comes to the position of short guard and executes short thrust.

(5) *Jab.*—Place both closed fists under the chin.

(6) *Parry.*—Strike a blow diagonally across the body in the direction in which the parry is to be made, fist closed. Follow by signal for thrust.

(7) *Vertical butt strokes.*
(*a*) Make an upper cut with right fist to indicate vertical butt stroke No. 1.
(*b*) A straight right from the shoulder for No. 2.
(*c*) For the slash following butt stroke No. 2, carry the right hand upward and over the left shoulder, fingers extended and joined, and slash downward.
(*d*) Deliver an over-arm blow to indicate the butt stroke following the slash.

(8) *Horizontal butt strokes.*
(*a*) Make a right hook to indicate a horizontal butt stroke.
(*b*) Carry the right hand over the left shoulder, fingers extended and joined, and slash horizontally toward the right to indicate the slash following the horizontal butt stroke.

(9) *Disengage.*—Describe an arc downward and forward with the right hand, fingers extended and joined, in the direction the disengage is to be made. Follow by signal for thrust.

(10) *Cut-over.*—Describe an arc upward and forward as above.

10–7. Master and pupil practice.—*a.* Whether working with the training stick or by the signals, the vigor and spirit of the master will be reflected in the work of the pupil with the bayonet. In handling the training stick or making the signals, the master must be speedy and aggressive and encourage his pupil to attack in the most determined and offensive manner. The same desire to win that makes the man close with his enemy in actual combat must drive the bayonet fighter at the training stick or the target indicated by the master's signal. In addition, the master will be constantly on the alert to detect and correct the errors of the pupil.

b. In executing the movements by the signals, the point of the bayonet will follow the movement of the master's hand regardless of the relative right or left. When the proper execution of a movement requires that the pupil advance, the master will step to the rear quickly as he gives the signal in order that his pupil may move with the utmost freedom and vigor.

10–8. General rules for bayonet training.—*a.* Scabbards will not be removed from the bayonets except for thrusting at dummies and practice at withdrawal boards.

b. The guard, thrusts, withdrawals, parries, and the jab will be taught first with the left then the right foot forward. Later the men will learn to handle the rifle and bayonet both right-handed and left-handed.

c. All of the positions and movements will be taught right-handed before any left-handed practice is allowed.

d. The short thrust and jab naturally follow the long thrust in the sequence named. When executing these three movements in rapid succession, the withdrawal position after a long thrust is the starting position for a short thrust, and the withdrawal position after a short thrust is the starting position for a jab.

e. When practicing long thrust or short thrust alone, the rifle is snapped back to guard from the withdrawal position.

f. The withdrawal, once taught, will be made after every thrust.

g. Ranks working together will always be far enough apart to prevent accidents when thrusts are being made. When thrusts are made advancing, the ranks will change positions by coming to high port, marching in double time past each other, and turning about. When working against dummies, men will always continue the movement past the dummies, which they will leave on their right.

h. A target at which to thrust will always be clearly marked on all dummies. Cardboard disks for this purpose are desirable. By continually changing the position of the mark, the "life" of the dummies is considerably prolonged.

Section III.—BAYONET TRAINING AND COMBAT PRACTICE IN DETAIL

10–9. Vulnerable parts of the body.—The point of the bayonet should be directed against the opponent's throat, especially in hand-to-hand fighting, so that the point will enter easily and make a fatal wound on penetrating a few inches. Other vulnerable and frequently exposed parts are the face, chest, lower abdomen, thighs, and, when the back is turned, the kidneys. The armpit, which may be reached with a jab, if the throat is protected, is vulnerable because it contains large blood vessels and a nerve center.

Four to six inches penetration is enough to incapacitate and allow a quick withdrawal, whereas if a bayonet is driven home too far it is often impossible to withdraw it. In such cases, a round must be fired to break up the obstruction.

10–10. Guard.—*a. Description of position.*—The point of the bayonet is directed at the base of the opponent's throat, the rifle held firmly but not rigidly with both hands without canting. The left hand, palm against the side of the rifle, is at the most convenient position in front of the rear sight so that the left arm is only slightly bent, the right hand, palm to the left, grasping the small of the stock and the right forearm pressing the upper part of the butt to the body. The legs are separated as in taking a natural step and meeting with resistance; left foot leading, both knees slightly bent, the leading knee the more; feet separated laterally a few inches and both feet flat on the ground, toes pointed as the man naturally points them in walking. The weight is balanced on both legs.

FIG. 122.—Guard

The position must not be constrained in any way, but must be one of aggressiveness, alertness, and readiness to spring forward for instant attack. (Fig. 122.)

b. Common faults.

(1) Body inclined backward.

(2) Left arm too straight or bent too much.

(3) Right hand held too low and too far back.

(4) Rifle gripped too rigidly, restraining all freedom of motion.

10–11. Short guard.—The left hand grasps the rifle just under the stacking swivel, left arm slightly bent, right hand grasping the small of the stock and resting against the right hip. The point of the bayonet is directed at the base of the opponent's throat. The body, legs, and feet are as in guard.

10–12. Rest—To assume the position of rest from guard, lower the piece smartly to the side, butt resting on the ground near the right foot, the right hand grasping the piece above the lower band. The feet remain as in the position of guard. (Fig. 123.)

FIG. 123.—Rest

10–13. High port.—*a.* From the position of guard, without changing the grasp of the hands, carry the piece diagonally across the body until the left wrist is level with and in front of the left shoulder.

b. The high port is adopted only when actually preparing to assault. At other times the rifle is carried on the shoulder, at the trail, or slung, according to circumstances. (Fig. 124.)

FIG. 124.—High port

10–14. Jumping trenches.—*a. Jumping into a trench.*—In jumping into a trench, the piece will be carried in both hands with the bayonet pointing down and to the left, the point of the bayonet being allowed to enter the ground an inch or two as the soldier alights in the trench. The bayonet must point in close to the man jumping in order to avoid injury to the man on his left.

b. Jumping out of a trench.—In preparing to assault from a trench, the bayonet fighter crouches low and close to the parapet, piece grasped in either hand, bayonet pointing up, the other hand grasping the edge of the trench. At the moment of springing out, the rifle is swung up and over the parapet, the bayonet fighter vaulting out assisted by the hand grasping the edge of the trench. While crouching in the trench no part of the head, hand, or the bayonet must be exposed above the trench.

c. Jumping over trenches in an assault.—Jumping trenches and surmounting obstacles will usually be done by throwing the piece sharply forward and upward from the high port on taking off and bringing it back in on landing. This

jumping will also be practiced with the position of the piece approximately maintained with the left hand alone, leaving the right hand free. The men will also be trained to jump holding the rifle in the guard position and snapping it up quickly on taking off. The grasp of the hands remains the same, and the piece is started down when the man is at the highest point in his jump, thus bringing him down in a good position for thrusting. These jumps apply the principle of jumping with weights.

10–15. Long thrust.—*a. Description of movement.*—The rifle is gripped with all possible strength and the point is driven vigorously from the guard position to the full extent of the left arm, quickly extending the whole body to the front, butt running along the inside of and against the right forearm. In delivering the thrust, the right elbow is carried low and the butt remains between the right forearm and the body. The leading knee and ankle are well bent, the rear leg braced with the heel raised, the body inclined well forward.

The power of the thrust comes from the right arm, the shoulders, the back, the legs, and weight of the body. The left arm is used more to direct the point of the bayonet. A vigorous thrust delivered without advancing throws a man off balance, but in fighting he preserves his balance by stepping in with the rear foot as he thrusts. After a man has learned the details of a thrust, it will always be delivered while advancing. *The eyes must be fixed on the object at which the thrust is made.* In making thrusts other than straight to the front the leading foot should move laterally in the direction in which the thrust is made.

The long thrust is made at an opponent at a range of 5 feet from the attacker's eye. It is very important to be able to judge this distance. In advancing on a dummy, men are prone to let the momentum of the body carry the point through the dummy without making the thrust. This must be guarded against, as it brings the point forward at the same rate of speed as the body, which is fairly uniform and easily judged. The darting forward of the point at the last instant gives a speed that is more difficult to judge. (Fig. 125.)

FIG. 125.—Long thrust

b. Common faults.—The following faults should be guarded against in executing long thrust:

(1) Rifle drawn back just before delivering the thrust.
(2) Elbow and butt of the rifle held as high as or against the right shoulder.
(3) Eyes not directed at the point thrust at.
(4) Leading knee not sufficiently bent.
(5) Body not inclined far enough forward.
(6) Point not going forward on a straight line.
(7) Butt not braced against the inside of the right forearm.
(8) Thrust made with the arms alone and not with the power of the whole body.

10–16. Withdrawal from long thrust.—*a. Description of withdrawal.*—To withdraw the bayonet after a long thrust has been delivered, the left hand is slipped toward the stacking swivel, the rifle is jerked straight back along the line of penetration with the force and weight of the entire body until the right hand is behind the hip, this without unduly relaxing the grip of the small of the stock, and the guard position is immediately resumed.

The weight of the body is carried to the rear by straightening out the leading leg and straightening the body at the waist. The foot in rear will be advanced quickly as the left hand is slipped forward unless the proximity to the object transfixed renders it unnecessary. After every thrust, a rapid withdrawal is made before coming to guard. In combat, a quick withdrawal is necessary to get ready to meet another enemy, and to prevent the one just stuck from wrenching the rifle from the bayonet fighter's hands in falling. (Fig. 126.)

b. Common faults.—The following common faults should be guarded against in the execution of withdrawal from long thrust:

(1) Not making the withdrawal vigorously enough.

(2) Not drawing bayonet back on line of penetration, i. e., letting the butt drop.

10–17. Long thrust at changing targets.—The class, working in pairs, with the instructor supervising, will be practiced without word of command in thrusting at various directions, e. g.:

a. At the opposite man's hand, which is placed in various positions on the body.

b. At thrusting rings on the ends of training sticks.

10–18. Long thrust at disks on dummies.—*a.* The men will be taught to transfix a disk or circle painted on a dummy, first from a halt at a distance of about 5 feet from the dummy (i. e., extreme range of the bayonet), and then, after advancing 3 or more paces. Later, the distance and speed are increased as the men progress. The advance must be made in a practical and natural way, and will be practiced with either foot to the front when the thrust is delivered. The rifle will not be drawn back just before making a thrust in a forward movement. The impetus of the body and the forward stretching of the arms supply the maximum force.

The bayonet must be withdrawn immediately after the thrust has been delivered and a forward threatening attitude assumed to the side of or beyond the dummy.

Unless the rifle is firmly gripped, it is liable to injure the hand. By gripping the rifle as far back on the small of the stock as the comb permits, the forefinger will be saved from being cut by the trigger guard.

FIG. 126.—Withdrawal from long thrust

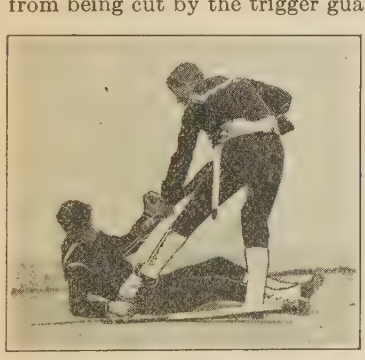

FIG. 127.—Withdrawal

b. To guard against accidents, the men will be at least 5 feet apart when the practice is carried out collectively.

c. The principles of this practice will be observed while thrusting at dummies in trenches, standing upright on the ground, or suspended from gallows. They should be applied at first slowly and deliberately, for no attempt must be made to carry out the assault training before the men have been carefully instructed in and have thoroughly mastered the preliminary lessons. (Fig. 127.)

10–19. Short thrust.—*a.* If at the position of guard, short guard is assumed by shifting the left hand quickly toward the muzzle and drawing the rifle back until the right hand is against the right hip, this without unduly relaxing the grasp of the small of the stock, the butt either upward or downward, according as a low or a high thrust is to be made; then deliver the thrust vigorously to the full extent of the left arm, as in long thrust.

When immediately preceded by a long thrust, the short thrust is delivered from the position of withdrawal from long thrust.

b. The short thrust is used at a range of about 3 feet, and in close fighting it is the natural thrust made when the bayonet has just been withdrawn after a long thrust. (Fig. 128.)

10–20. Withdrawal from short thrust.—Withdrawal from short thrust will be practiced in two ways—

a. In the same manner as withdrawal from long thrust.

b. If a strong withdrawal is necessary or the short thrust is to be followed immediately by the jab, the right hand is slipped up in rear of the left hand after the short thrust has been made. (Fig. 129.)

10–21. Short thrust at changing targets and at dummies.—The principles of delivering the long thrust at changing targets and at dummies will be observed in so far as they apply. By placing two or more disks or circles on the dummies, the short thrust may be taught in conjunction with the long thrust,

FIG. 128.—Short thrust

FIG. 129.—Withdrawal from short thrust

the first disk being transfixed with the long, the second with the short thrust. This will also be practiced by delivering a long thrust advancing at a prone dummy and immediately following the withdrawal with a short thrust at an adjacent swinging dummy.

10–22. The jab.—*a. Description of movement.*—Immediately following the withdrawal from short thrust the rifle is brought to an almost vertical position, close to the body, along the outside of the right leg, butt near the right foot. From this position, stepping in if necessary, the knees are bent and, with the full force of the body, the point of the bayonet is jabbed upward into the throat or other part of the opponent. *After any move that carries the point beyond the enemy, the bayonet fighter comes immediately to the short thrust or jab position—that is, keeps the point between himself and his enemy.* (Figs. 130, 131.)

FIG. 130.—The jab. Starting position

b. Common faults.—The following common faults should be guarded against in executing the jab:

(1) Rifle drawn backward and not held upright enough.

(2) Rifle grasped too low with the right hand.

(3) All the work done with the arms without putting the whole body into it.

(4) Rifle not pressed against the leg.

(5) Jab too high and not vigorous enough.

10–23. Parry right (left).—*a. Description of the parries.*—From the position of guard, the body is forced forward to the full extent of the reach, and the left arm is straightened vigorously without bending the wrists or twisting the rifle in the hands, at the same time engaging the opponent's piece and deflecting it just clear of the body. The barrel is kept up, the point threatening the opponent's body, preferably his throat. If the parry right is properly made, it is easy to kill the opponent with the thrust which immediately follows. In fact, the opponent will usually impale himself on the point. In parry left, the point is carried out of line with the opponent's body, but can be brought back quickly, as it is nearer this line than the oppo-

nent's point. Parry left is followed up at once either with a thrust or a butt stroke to the ribs or jaw. During the parry, the eyes must be kept on the weapon being parried, but, having completed the parry, are instantly fixed on the part of the opponent's body to be attacked.

FIG. 131.—The jab completed. Power of thrust comes from straightening the legs

Emphasis will be laid on the forward movement of the rifle and body. Very little lateral movement of the rifle is necessary in order to deflect the point of the opponent's bayonet enough to permit driving home a thrust.

Men will be taught to regard the parry as an offensive movement and so execute it.

b. Common faults.—The following common faults should be guarded against in the execution of the parry:

(1) Wide sweeping parry with no forward movement in it.

(2) Eyes taken off the weapon being parried.

(3) Making the arms do all the work and not getting the weight, strength, and momentum of the body into the parry.

(4) Lack of force in the parry.

FIG. 132.—Parry right

10–24. Parrying the training stick.—*a.* The class will work in pairs. One man thrusts with the padded end of the training stick and the other parries. The guard position is resumed after each parry. Later, the man with the rifle advances as he parries, executes a long thrust followed by a withdrawal, and resumes the position of guard. At first this practice must be slow and deliberate without being mechanical. It should be increased in rapidity and vigor as the instruction pro-

FIG. 133.—Low parry right

FIG. 134.—Parry left

FIG. 135.—Low parry left

gresses. Care will be taken that the man thrusting with the stick does not swing it into the man with the rifle. If sweeping movements are made with the stick, the man with the rifle will probably develop sweeping parries.

b. For the thrust and parrying exercises a light stick, 5 feet to 5 feet 6 inches long and ¾ to 1 inch in diameter, must be provided for every two men.

A pad 4 to 5 inches in diameter, made of canvas and stuffed with shredded sacking, is secured by wire set in a notch cut in the stick. A grommet with about 3 inches interior diameter is similarly secured near the upper end of the stick.

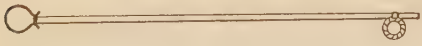

FIG. 136

The parrying stick is used for practicing the thrusts and jab, according to the position of the ring alternating with butt strokes and kicks at the pad, according to its position.

c. The men will also be taught to parry thrusts made at them with the training sticks—

(1) By an enemy in a trench when they are themselves on the parapet.

(2) By an enemy on the parapet when they are in the trench.

(3) When both are fighting on the same level at close quarters in a deep trench.

d. Training sticks long enough to represent the opponent's weapon in the guard position should be attached to the dummies. The training stick is run through a small ring attached to either side of the dummy and is held loosely in place by a man in rear of the dummy. The bayonet man, advancing, parries the training stick and delivers a long thrust at the dummy.

10–25. Fending off.—Practice will also be given in fending off the opponent's point with *either bayonet or rifle in any position*, such as guard, short guard, and the position for delivering a jab.

10–26. Methods of injuring an opponent.—It should be impressed upon all that, although a man's thrust has missed or has been parried, or his bayonet has been broken, he can, as attacker, still maintain his advantage and injure his opponent.

In individual fighting in the open, the butt can be swung horizontally against the opponent's jaw or other vulnerable parts. This method is impossible in trench fighting or in an attack, owing to the horizontal sweep of the bayonet to the attacker's left. Here the butt must be swung in the vertical plane. In many instances, a kick to kneecap or crotch will aid the butt stroke. *A butt stroke or kick will only temporarily disable an enemy*, and it should be clearly understood that the butt must not be employed when it is possible to use the point of the bayonet effectively.

FIG. 137.—Vertical butt stroke No. 1. Crotch blow

10–27. Trench or vertical butt strokes.—*a. Butt stroke No. 1.*—Swing up the butt at the opponent's crotch, ribs, forearm, or any exposed part of the body, using a half-arm blow, advancing with the rear foot.

b. Butt stroke No. 2.—If the opponent jumps back so that the first butt stroke misses the rifle will come into a horizontal position over the left shoulder, butt leading. The attacker will then jump in and dash the butt into his opponent's face.

c. Slash.—If the opponent retires still farther out of range, the attacker again closes up and slashes his bayonet down on the opponent's head, or the neck if the opponent is wearing a steel helmet. In the event of missing, he will then be in the guard position.

d. Butt stroke No. 3.—If the point is beaten or brought down, the butt can be used effectively by crashing it down on the opponent's head with an over-arm blow, advancing the rear foot. When the opponent is out of distance, the slash can again be used. The attacker will then be in the guard position. (Figs. 137 and 138.)

10–28. Open ground or horizontal butt strokes.—*a. Butt stroke No. 1.*—With a half-arm blow swing the butt up at opponent's jaw, advancing the rear foot.

b. Butt stroke No. 2.—The butt can now be dashed into the opponent's face as described under vertical butt stroke No. 2 above.

c. Slash.—If the opponent jumps back so that the first stroke misses, the rifle will come into horizontal position over the left shoulder, butt leading. The attacker will then step in with the rear foot and slash the bayonet against the opponent's head or neck. If the opponent retires farther out of range, the attacker will be in the guard position. (Fig. 140.)

FIG. 138—Vertical butt stroke No. 1 Stomach blow

10–29. Other phases of in-fighting.—Butt strokes can only be used in certain circumstances and positions, but if men acquire absolute control of their weapons under these conditions, they will be able to adapt themselves to all other phases of in-fighting. For instance, when a man is gripped by an opponent so that neither the point nor the butt can be used, the knee brought up against the crotch or the heal stamped on the instep may momentarily disable him and make him release his hold.

10–30. Close fighting methods against dummies.—When the class has been shown the methods of using the kick, the rifle butt, and the knee, they should be practiced against one or more dummies, combining them with the thrusts and the jab, e. g., advancing, use the heel on a prone dummy, deliver a thrust at a swinging dummy, the knee or butt against another fixed close to or on the ground, and so on in varied methods of attack. In order to avoid damaging it, light dummies should be used for practice with the butt.

10–31. To disarm an opponent.—*a.* Fend off opponent's thrust with the right hand. Step forward and seize his left hand with both hands, the left under his palm, the right over his fingers. Give a sharp twist outward.

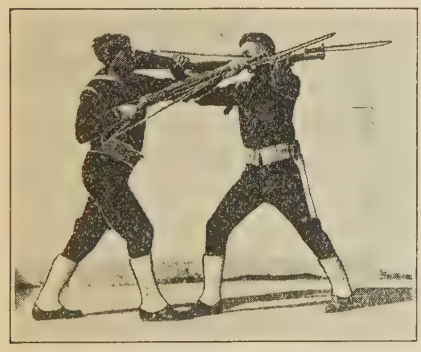

FIG. 139.—Butt stroke No. 2. Face blow

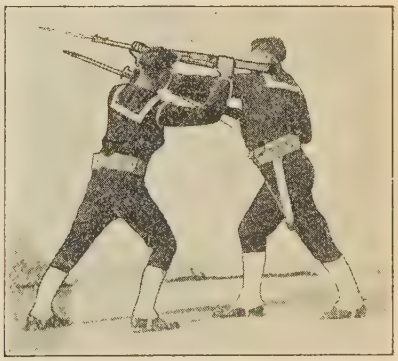

FIG. 140.—Horizontal butt stroke No. 1 Blow on jaw

b. Fend off oppenent's thrust with the right hand. Step in and seize his left wrist firmly with the right hand; grasp the rifle just below the bayonet with the left hand, back of the hand down, and swing it violently upward and over to the right, at the same time stepping in and kicking or bringing the left knee into the lower part of the opponent's body.

c. Fend off opponent's thrust with the left hand; step in and kick him in the crotch or on the shin. Grasp the rifle below the bayonet with the right hand.

back of hand down, and swing it upward and over to the left; force the point of the bayonet to the ground, and, stepping in, back-heel the opponent.

10–32. Obtaining good direction and quickness with the training stick.—*a.* The men work in pairs as master and pupil, the pupil with the rifle in the guard position and the master with the training stick. As the master approaches and places the ring or padded end of the training stick on the ground near the pupil, the latter comes to guard and threatens the master with his point as long as he is sufficiently near to attack. The master then offers the ring or padded end of the stick in varying positions—

(1) If the ring is presented, the pupil attacks with a thrust or the jab as the distance between his point and the stick indicates. If the ring is holed, the withdrawal is made and the position of guard resumed. If the first effort is a miss, the pupil will come on with short thrust and jab until successful.

(2) If the master presents the padded end of the stick, the pupil makes butt stroke No. 1 at it. If this is a miss, he comes on with butt stroke No. 2, etc., until he hits the padded end. As soon as he hits it, he resumes the guard. To practice the pupil in all the butt strikes, the master jerks the stick away a short distance just before butt strike No. 1 hits it, causing the pupil to miss and come on with butt stroke No. 2. Just before butt stroke No. 2 hits the stick, the master again jerks it away, causing the pupil to miss and come on with the slash.

(3) If the padded end of the stick is thrust at the man with the bayonet, he parries as described in paragraph 10–24.

b. At the command **FORM CIRCLE** the pupils, not more than 10 in number, form in a circle facing the instructor with an interval of about 3 paces, at the position of guard. The instructor offers the ring or padded end of the training stick in varying order to the pupils who attack as laid down in subparagraph *a.* This circle may also be formed with the pupils facing outward. At a touch from the training stick, the pupil whirls about and attacks as before.

10–33. Hand parries.—In order to impress on the pupil the necessity of a strong withdrawal from long thrust and short thrust and to cause him to impart a powerful movement to the jab, the following exercise will be carried out with the men working in pairs as master and pupil, the master unarmed and the pupil with rifle and bayonet:

a. At a hand signal made by the master, the pupil delivers a long thrust, advancing; the master steps back and with the free hand fends the thrust, grabs and holds the bayonet to give the pupil's withdrawal the necessary resistance.

b. At a second signal, the attack is continued with the short thrust, the retreat and fend being repeated by the master. In fending the thrusts, the master quickly pushes the bayonet outside the line of his body, immediately grabs it with both hands, and offers the necessary resistance as stated above.

10–34. Assault practice.—This practice will approximate as nearly as possible the conditions of actual fighting, and will not be undertaken until the men have received thorough preliminary training and have acquired complete control of their weapons.

a. In any assault, the attackers are necessarily subjected to severe physical exertion as well as to great nervous tension, while the defenders are comparatively fresh. Therefore, quick aim and good direction with the bayonet when attacking, while moving rapidly or surmounting obstacles, accurate and vigorous delivery of the thrust, and clean, quick withdrawals are of the greatest importance, and need the same careful attention and constant practice as are devoted to obtaining efficiency in shooting the rifle.

In the assault practice the charge brings the man to the first "enemy" in a comparatively breathless condition, and the accuracy of the aim is tested by the disk, which can only be transfixed by a true and vigorous thrust.

b. For this practice, the men will be made to begin the assault from a trench, 6 or 7 feet deep, as well as from the open.

10–35. Trench system for assault practice.—A labyrinth of trenches, with dummies in varying positions with shell holes and obstacles of various sorts between the trenches, forms an excellent assault practice course. Assaults should be made from all four sides in order to give variety. The edges of the trenches should be protected by spars or balks anchored back, otherwise constant use will soon wear them out. Cinders scattered over the course will prevent the men from slipping. If gallows can not be erected, sack dummies should be

placed on tripods or on end, as well as lying in trenches or on the parapet, with soft earth, free from stones, under them.

10–36. Combined tactics.—A combined bullet and bayonet course may be had by placing stationary or disappearing silhouette targets at a suitable distance from the end of the assault course, and causing the attackers to open fire upon them from a position in a trench or in the open at the finish of the bayonet assault. The ingenious instructor can arrange some very interesting and practical exercises by combining the tactics of the bayonet assault with those of other branches of infantry training.

10–37. Wooden-rifle combat.—Wooden-rifle combat, like boxing and wrestling, introduces into the training the most important element of personal contact, without which the true fighting spirit can not be properly developed. The work with the wooden rifles is very slow and easy at first, the men gradually working up speed until they come together at full tilt. Gloves, masks, and plastrons will always be worn, and the instructor will be responsible for the prevention of serious accidents. Men begin this combat practice with both standing still; then one advances at a walk while the other stands still; then both advance at a walk; then one man advances at a run while the other stands still, and finally, both men advance at a run.

10–38. Success in wooden-rifle combat.—*a.* The individual will win consistently in wooden-rifle combat only as he has developed aggressiveness, skill, and speed through long and continuous training. In particular, the ability to score hits over an opponent will depend upon a lightninglike parry and thrust; upon the effective handling of the wooden rifle in close body-to-body fighting; and upon the ability to see and avail himself quickly of any opening offered by his opponent.

b. In addition, the successful attack in individual combat is the one which most effectively conceals from the opponent the intended point of attack by the use of various feints, e. g.:

(1) *Disengage.*—If the opponent's point is held high, drop the point of the bayonet slightly with the left hand and bring it up on the opposite side of opponent's piece, coming in at the same time. The point should go forward about a foot in the act of passing under the enemy rifle.

(2) *Cut-over.*—If the opponent's point is held low, bring the piece to the opposite side by passing it over his.

(3) *Cross-step.*—In charging in on an opponent, cross the rear foot over the leading one just before reaching effective range with the bayonet (i. e., 5 feet), thereby attacking him from one side or the other instead of directly from the front. This maneuver is similar to that of an open-field runner in football avoiding a tackler.

c. Footwork.—The men will be given practice in advancing and closing rapidly with an enemy; in moving quickly short distances to either side and in dodging. However, the instructor must make certain that the instinct to close instantly with one's enemy is developed through these practices and that the bayonet fighter does not hold off and fence with his opponent.

10–39. Combat practice—rushing.—Two men will place themselves 20 yards apart, each at the guard position. At signal, they charge each other. Unless a clean, hard hit is made in 20 seconds, they will be separated and a hit counted against each. Men should never be allowed to fight for more than one hit in any assault.

The men should be encouraged to hold the piece at the short guard. This compels in-fighting.

10–40. Common faults.—All tendencies to wildness will be rigorously checked. If during the rushing there appear any of the following mistakes, men who commit the errors are taken out and the instructor works with them individually until they recover their form:

a. Flagrant loss of aim or balance.
b. Light tapping touches.
c. Hitting with side of the bayonet.
d. Pushing with the rifle.
e. Useless parries or movements of the rifle.
f. Slowing up just before the shock.

10–41. Rushing in groups.—*a.* Let one man receive the assault of two or three others, placed one behind the other at 10 or 15 pace distance.

b. Let one man receive the assault of two others at 6-pace interval, converging upon his flank at 20-pace distance.

c. Let one man receive the assault of two others at 6-pace interval, converging upon him as they come.

d. Have men fight when one is in the trench and one on the parapet, and when both men are in a narrow trench.

e. Vary these formations in any way that may appear valuable and instructive.

10–42. Team fighting.—After the men have attained proficiency in individual combat, squad will be opposed to squad and platoon against platoon, as in paragraph 10–34, men being substituted for dummies.

10–43. Trench combat.—In trench combat, when the man comes to a turn in the trench, he makes a quick vault around the corner of the trench. As he lands, he has the rifle in the guard position (on the right side if the trench turned to the left; on the left side if it turned to the right) ready to beat the opponent's weapon aside or make a quick thrust. There is nothing to be gained by looking first, as it insures the enemy being ready. If a place is encountered alone where one trench crosses another about at right angles, it is well to look first, as one man has no show if there is an enemy on each side of the entrance. If the man finds one side clear, he vaults into the other without delaying to look. If two men approach such a trench, they approach as nearly on a line as the width of the trench will permit. One vaults to the right and the other to the left without stopping to find out first whether the trench is occupied.

10–44. Problems in wooden-rifle combat.—Any number of excellent combined problems may be worked out with wooden-rifle combat equipment. In the solution of these problems a trench system must be had, umpires used, and it will often be necessary to arrange distinguishing marks for opposing sides. The following are some that will prove particularly interesting and instructive:

a. A detachment of Reds is ordered to attack a certain point in a quiet Blue front-line trench and capture one or more prisoners.

b. The conduct of a Red detachment while driving a Blue detachment down Blue's communication trench to his second-line trench.

c. A Red patrol, equipped with bayonets and grenades, in No Man's Land at night, unexpectedly encounters a Blue patrol.

d. Reds have assaulted and taken a Blue position, and are engaged in consolidating it when Blues counterattack.

(1) Reds have plenty of ammunition.

(2) Reds have no ammunition.

(NOTE.—Reds may or may not have automatic rifle.)

e. Defending Reds to meet assaulting Blues with a countercharge.

Section IV.—SUGGESTIONS FOR INSTRUCTORS

10–45. Length of lesson and practice.—As it is not the intention nor is it necessary to make the technique of bayonet fighting difficult, long detail is quite unnecessary and serves only to make the work monotonous. All instruction must be carried out on common-sense lines. It should seldom be necessary to give a demonstration more than two or three times, after which the individual should acquire the correct position by practice. For this reason, a lesson or daily practice should rarely last more than one hour, given in two parts of half an hour each. Nothing kills interest so quickly as monotony.

Simplicity in all explanations is essential. The instructor will insist on basic principles only. Each man has his own individual way of fighting.

10–46. Work made interesting.—Interest in the work may be created by explaining the reasons for the various positions, the method of handling the rifle and bayonet, and the uses of the thrusts. Questions should be put to the men in order to ascertain whether they understand these reasons. When men realize the object of their work, they naturally take a greater interest in it. The instructor must have the men consider him a trainer and helper.

10–47. Progression.—The various points having been properly covered in the instruction, skill, speed, and strength in execution are acquired from continual practice. The different positions, movements, and practices are arranged in the sequence in which the instruction should progress and this progression should not be unduly delayed in order to attain perfection.

10–48. Conduct of classes.—*a.* The class is always formed with two ranks facing each other, with a 3-pace interval. The instructor goes wherever necessary, but while demonstrating a movement he should station himself to one flank and in prolongation of the center line between ranks.

b. It is well to begin each lesson with a series of quickening movements, exercises, or games which develop coordination of the muscles used in bayonet combat. Following this, the instructor reviews briefly movements previously taught. Again, after combat practice he reviews for a few minutes positions and movements and corrects faults induced by simulated individual fighting.

10–49. Size of class.—The maximum number of men to be trained by one instructor is 20. Better results will be obtained with a class of 10. Each man requires individual instruction and supervision. With a large class, this is impossible.

10–50. To teach a position or movement.—*a.* The position or movement will first be demonstrated and all essential points explained, with reasons for each. Then the position or movement is shown again, with the class observing each essential point, so that from the very beginning of his training the soldier is taught to use his eyes and brain. The class will next assume and practice at will the position or movement just explained, and the most glaring faults are corrected. After a working knowledge of the position or movement has been gained, practice in it will be continued, with the men working in pairs as master and pupil, using either hand signals or the training sticks.

b. It is a serious mistake to try to get a class of beginners to idealize at once. Only by constant practice and continual correction can perfection be obtained.

c. For closer personal instruction, the instructor may call out the men by pairs, letting the others practice at will the positions and movements already taught.

10–51. Competitions.—Competitions arouse and maintain interest in the work. In particular, two phases of bayonet training lend themselves to competitive work—

a. Assault course practice.—Competitions may be conducted between squads, classes, or larger groups, each group in turn running the assualt course. The time from start to finish is taken and a record made of the number of hits secured by transfixing disks placed on dummies in various positions (i. e., prone, kneeling, swinging, etc.). Such a competition might also include firing with ball ammunition at targets suitably placed in position at the end of the assault course. In the latter case, the comparative standings of competing groups depend on—

(1) Time of performance.
(2) Hits secured against dummies with the bayonet.
(3) Results of the firing.

b. Wooden-rifle combat.—No particular activity in a bayonet training course so arouses interest and enthusiasm in the work as a wooden-rifle combat tournament. The champion wooden-rifle fighter of the squad, section, platoon, etc., is determined by the process of elimination, winners of individual bouts being paired against each other until but one winner remains. Such a competition should not be undertaken until the men have attained a reasonable degree of handiness with the wooden rifle.

Outline of Progressive Instruction

10–52. The following outline is furnished as a guide and in order to insure thorough and progressive instruction. A list of such movements as are to be covered during the drill period should be made by the officer or petty officer in charge and be used as necessary in conducting the exercises:

A

(Movements 1 to 26 by word of command)

1. Intervals, distances, and positions.
2. Explain hand-to-hand fighting, and inculcate the spirit of the bayonet.
3. Guard.
4. Rest.
5. High port.
6. Long thrust.
7. Withdrawal.
8. Oblique long thrust.
9. Long thrust, followed by long thrust advancing rear foot.
10. Explain value of parries; how, in charging, the parry must be strong enough to beat aside the opponent's weapon.

11. Explain and make the class perform the movements required for the various parries.
12. Demonstrate the short thrust and explain when it is used.
13. Short thrust.
14. Withdrawal.
15. Oblique short thrust.
16. Short thrust advancing rear foot.
17. Long thrust advancing rear foot, followed by short thrust advancing rear foot.
18. Demonstrate "jab"; then, by placing men in suitable positions, explain when and how it is used in conjunction with thrusts.
19. Jab from jab position.
20. Short thrust advancing rear foot, followed by jab advancing rear foot.
21. Long thrust advancing rear foot, followed by jab advancing rear foot.
22. Short thrust advancing rear foot; jab advancing rear foot; long thrust advancing rear foot.
23. Butt stroke I (upward swing).
24. Butt stroke II (forward strike).
25. Butt stroke II (slash).
26. Butt stroke III (downward blow).
27. Trips practiced by men working in pairs.

B

Class working by eye and thrusting at the open hand of the opponent, placed in various positions on and off the body. Exercise care not to injure the opponent by making the thrusts too vigorous. **Bayonet scabbards fixed to bayonet.**
28. Long thrust.
29. Long thrust, followed by long thrust advancing rear foot (opponent retiring).
30. Short thrust.
31. Short thrust advancing rear foot.
32. Long thrust advancing rear foot, followed by short thrust advancing rear oot (opponent retiring).

C

Class working by eye. Exercises with parrying stick and thrusting ring. **Bayonet scabbards fixed to bayonet.** Men work in pairs.
33. Varied direct and oblique long thrusts at thrusting ring.
34. Parry the stick pointed at the breast.
35. Parry the stick pointed at the breast and deliver thrust.
36. Parry the stick pointed at the head, body, and legs.
37. Same as 36, and deliver thrusts.
38. When standing in a trench, parry thrust made with stick from above.
39. When standing on a parapet, parry a thrust made with stick by a man in a trench.
40. With stick parry a thrust made with stick by advancing opponent.
41. Same as 40, and come back with a thrust.
42. With stick parry thrust made with stick lightly held in one hand by charging opponent (by holding his stick in right or left hand, the attacker will clearly show on which side he is thrusting, and he will pass on that flank).
43. Varied direct and oblique long and short thrusts at thrusting ring.
44. Practice various parries, parries and thrusts, from short thrust position against parrying stick and thrust ring.
45. Jab at thrusting ring.
46. Direct and oblique long and short thrusts and jabs, in varying order, at thrusting ring.
47. When in jab position, ward off high and low thrusts made with stick.
48. Butt stroke I (upward swing) at padded stick.
49. Butt stroke II (forward strike) at padded stick.
50. Butt stroke II (slash) at padded stick.
51. Butt stroke III (downward blow) at padded stick.
52. Long thrusts, short thrusts, and jabs, at thrusting ring, with butt strokes fat padded stick varied.

D

53. Vulnerable spots explained; region of kidney shown; practice careful thrusts, delivered without force, at these points, **bayonet scabbards fixed to bayonet.**

Practice against dummies, at designated disks or marks, bayonets fixed, **scabbards withdrawn.**

54. Withdrawal. (a) Stationary. (b) Advancing rear foot. (Demonstrated by instructor on a dummy.)

55. Long thrust.

56. Long thrust advancing rear foot.

57. Advance and deliver long thrust.

58. Advance and deliver long thrusts (at two or more dummies).

59. Dummy fitted with stick to represent opponent on guard. Advance, parry the stick, and thrust.

60. Short thrust.

61. Short thrust advancing rear foot.

62. Long thrust advancing rear foot, and short thrust advancing rear foot.

63. Advance and deliver long thrust and short thrust (at two dummies in suitable positions).

64. Short thrust advancing rear foot, and jab advancing rear foot.

65. Long thrust advancing rear foot, short thrust advancing rear foot, and jab advancing rear foot.

66. Advance, long thrust, and jab.

67. Advance, long thrust, short thrust, and two or more jabs at dummies.

68. Thrusts and jab, followed by butt strokes I to III at light dummies, and introducing kicks, and any other form of infighting.

A Guide for Trained Men's Daily Practice

(30 minutes)

10–53. (1) Five minutes.

(*a*) Long thrust at hand (28–29, progressive program of instruction) (not more than 8 thrusts each man).

(*b*) Short thrusts (30, 31, 32, progressive program of instruction) (not more than 10 thrusts each man).

(2) Five minutes, steady advance over obstacles and charge 20 yards, about 100 yards in all.

(3) Four minutes, parrying stick and thrusting (37, progressive program of instruction).

(4) Four minutes, butt strokes, each stroke twice (23, 24, 25, 26, progressive program of instruction) or practice trips, etc. (27, progressive program of instruction).

(5) Six minutes, long thrusts, short thrusts, and jabs at thrusting ring, with butt strokes at padded stick, varied (52, progressive program of instruction).

(6) Six minutes, final assault practice.

Section V.—EQUIPMENT

10–54. Service rifle and bayonet.—The rifle will always be in good condition—clean, oiled, and in perfect working order. Care will be taken that the object representing the enemy be incapable of injuring the bayonet or butt. Only light sticks will be used for parrying practice with the rifle. The chief causes of injury to the bayonet are: Delivering a sweeping thrust instead of a true or direct thrust; failure to withdraw the bayonet clear of the dummy before advancing, and placing prone dummies on hard, unprepared ground. The front-sight cover will not be removed during instruction with the bayonet.

10–55. Disks.—For obtaining good direction in thrusts there must always be an aiming mark on the dummy. Cardboard disks, 3 inches in diameter, can be improvised for this purpose. By continually changing the position of the disk, the life of the dummy can be considerably prolonged. Five or six circles can be painted on the dummies to take the place of disks; the disks, however, will always be used in competitions.

10–56. Dummies.—Dummies, representing in size the trunk of the body, should be constructed of brushwood whenever available. Failing this, sacks should be used filled with the material at hand that will offer most resistance to penetration and withdrawal without injuring the bayonet. Dummies must be

so suspended that they offer the most resistance to the attacker and at the same time can be easily replaced.

10–57. Withdrawal boards.—The withdrawal board is a device used to impress upon the mind of the student the amount of resistance to be expected in withdrawing the bayonet after a thrust. It can be constructed of a barrel stave or other board of similar dimensions hinged at the top to a 4 by 4 inch upright with the lower end left free. The instructor causes the student to place his

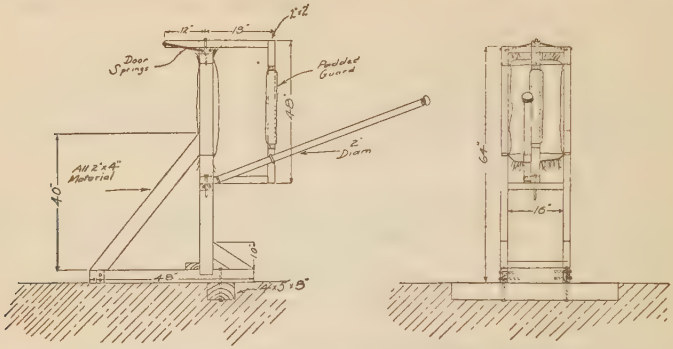

Fig. 141.—Constructive standing dummy with parrying stick

bayonet between the upright and the board, and then presses upon the free end of the board, thus clamping the bayonet between the board and the upright. The amount of pressure exerted by the instructor varies with the resistance which it is desired to illustrate.

10–58. Training sticks.—The training stick is a light stick, 5 feet to 5 feet 6 inches long and ¾ inch to 1 inch in diameter, padded at one end and provided at the other with a light rope or wire thrusting ring having a diameter of 3 inches.

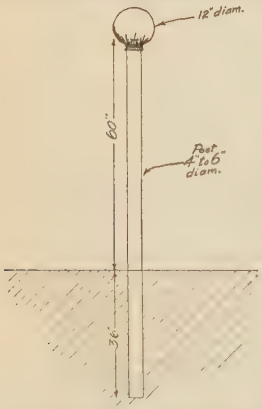

Fig. 142.—Construction jab dummy

10–59. Combat equipment.—*a. Plastrons, masks, and gloves.*—One set for each man.

b. The wooden rifle.—Same outline as the service rifle, except that the part which corresponds to the bayonet is in prolongation of the barrel, no attempt being made to have the bayonet below the barrel, as this would weaken the junction. The balance is the same as the service rifle, and the weight nearly the same. A tennis ball, fastened to the end by canvas strips, makes the best pad. Hair or excelsior will answer. The wooden rifle can be sawed out of a piece of timber 2 inches by 6 inches by 5 feet, preferably of oak or other wood not easily split, and trimmed into shape by hand. The length of the wooden rifle, with tennis ball attached, can be made the same as the Model 1903 rifle, with the bayonet fixed.

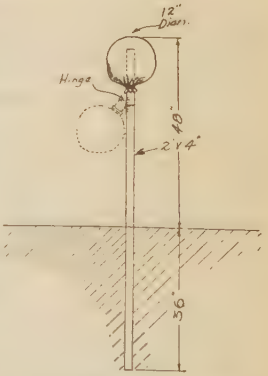

Fig. 143.—Construction butt stroke dummy

10–60. Boxing gloves and wrestling mat.—Boxing gloves and a wrestling mat are essential parts of the equipment. They are indispensable in developing close and rough-and-tumble fighting.

10–61. Trench system.—There must be one or more trench systems for use in the assault training, trench and obstacle jumping, mopping-up parties, trench raiding, and, in general, for the tactical application of the principles of the bullet, bayonet, and grenade combined. It is not desired to prescribe a fixed type of trench system. If the terrain is suitable for the construction of moving, bobbing, or disappearing targets, a combined course can easily be constructed.

Section VI.—THE TACTICAL APPLICATION OF THE BAYONET

10–62. To attack with the bayonet effectively requires **good direction, strength, and quickness** during a state of wild excitement and probably physical exhaustion. The limit of the range of a bayonet is about 5 feet (measured from the opponent's eyes), but more often the killing is at close quarters, at a range of 2 feet or less, when troops are struggling in trenches or darkness.

10–63. A bayonet assault should preferably be made under cover of fire, surprise, or darkness. In these circumstances the prospect of success is greatest. At night all these covers can be utilized.

On the other hand, confusion is inherent in fighting by night; consequently the execution of a successful night attack with the bayonet requires considerable and lengthy training.

The bayonet is essentially a weapon of offense, which must be used with skill and vigor; otherwise it has but little effect. To await passively an opportunity of using the bayonet entails defeat, since an approaching enemy will merely stand out of bayonet range and shoot down the defenders.

10–64. In an assault the enemy should be killed with the bayonet; go straight at the opponent with the point threatening his throat and deliver a thrust wherever an opening presents itself. If no opening is obvious, create one. Firing should be avoided, for in the mix-up a bullet, after passing through an opponent's body, may kill a friend who happens to be in the line of fire.

10–65. Nervous tension due to the anticipation of an attack, as well as the dash across the open and the final dash at the enemy, combine to tire an assaulting party. It is only by their physical fitness and superior skill in the use of the bayonet that they can overcome a comparatively fresh foe.

Therefore, quick aim and good direction of the bayonet when moving rapidly or even when surmounting obstacles, accurate delivery of a thrust and sufficient strength and vigor to penetrate clothing and equipment, the clean withdrawal of the bayonet—which requires no small effort, especially should it be fixed by the bone—are of the greatest importance, and need the same careful attention and constant practice as are devoted to obtaining efficiency with the rifle.

The Assault

10–66. The importance of discipline and organized control throughout the conduct of a bayonet assault can not be overemphasized. It must be remembered that in this, as in all other military operations, success can be achieved only through the closest cooperation of all concerned; and that, while individual initiative is not to be discouraged, it must be strictly subordinated to the intention of the leader of the assaulting party.

Men should be shown by demonstration that it is in their own interests to pay attention to this point, and that the failure of an enterprise can usually be traced to the lack of close cooperation.

10–67. During training the following general principles will be observed:

(1) All members of the attacking party must rise from cover and commence the advance simultaneously. In addition to the advantages of surprise, needless casualties are thereby avoided.

(2) The first stage, especially of a long advance, will be slow and steady—not faster than the pace of the slowest man. Such an advance has a decided moral effect on the enemy, makes certain of the maximum shock at the moment of impact, and at the same time allows the attacking force to reach its objective without undue exhaustion. On the other hand, if the assault is allowed to develop without control and in a haphazard fashion, the moral effect of the steady, resistless wall of men is lost, and the defenders may be given time to dispose of their opponents in detail.

Bayonet control in the attack is just as important and fully as practicable as fire control, and it depends altogether on discipline, which must be taught by close-order work, and on thorough technical instruction in the use of the bayonet. Tactical bayonet control will then follow without much difficulty, provided the instructor has done his work properly.

(3) The actual charge will not be made over a greater distance than 20 paces. Within the last 10 yards, and before closing with the enemy, the rifle will be brought to the threatening, yet defensive, guard position. Line will, as far as possible, be maintained until actual contact with the enemy is gained.

(4) As soon as the enemy's position has been carried, and prior to any attack on a further position, or any other operation whatsoever, every precaution must be taken against a counterattack.

10–68. Indiscriminate pursuit with the bayonet must never be allowed unless orders to that effect have been given the leader of the assaulting party. The attacking troops are not so fresh as the enemy, and experience has shown that unorganized pursuit lends itself to ambush and casualties from machine-gun fire. In most cases the work of immediate pursuit is better done by machine guns and by the supporting artillery, the infantry assisting by rapid fire on the retreating enemy.

In bayonet fighting no "fouls" are known. The only rule to follow is: "Get after your man and put him out of action by any means at your command."

Section VII.—WALL SCALING

10–69. Wall scaling is of somewhat limited application. It will without doubt be useful in street fighting and riot duty, and is also an excellent form of physical exercise.

The practical limit of height for rapid escalade is about 10 feet. Heights up to 15 feet can be scaled by the use of pyramid formations, and the use of lanyards 6 feet long, specially prepared for the purpose, fitted with an eye in one end large enough for man's hand, and a stopper knot fitted at the other. In an emergency, neckerchiefs knotted together, or gun slings secured by their buckles, can be used. However, the efficient scaling of high walls by such means is not practicable. When it is known beforehand that high walls will have to be scaled, two light scaling ladders, 12 feet long, should be provided for each company of the landing force requiring them. Such ladders can easily and quickly be made up by the carpenter's gang on board ship, from material on hand.

10–70. Every training station and barracks should have a "wall" for wall scaling instruction. The wall should be about 9 feet high and at least 20 feet long; the width at the top should be about 2 feet with a somewhat wider base, 2½ to 3 feet wide. Smooth boards, laid on horizontally on both sides of the wall, should be used; sharp edges at the top should be rounded off.

10–71. The unit for wall scaling is the squad. The rear rank mounts in combination with the front rank; there is no deployment of the squad preparatory to mounting.

Officers, petty officers, and file closers mount with the nearest or most convenient squad.

To Mount

10–72. Being in line, or column of squads, near the wall and facing it: 1. **Wall to the front (in succession to the front)**, 2. **MOUNT.**

At the first command, rear-rank men pass their rifles to the front rank. At the second command, the front rank runs to the wall, each man placing a rifle on either side of him, faces about, stoops with hands clasped to form a stirrup, and leans with the back against the wall; each rear-rank man runs toward his own file leader, places the left foot in the stirrup and springs lightly up, grasps the top of the wall and mounts it. Rifles are immediately passed up to the men on the wall, who continue over and dismount on the other side, taking the rifles with them.

Nos. 1 and 3 of the front rank stand fast; Nos. 2 and 4 mount as prescribed for the rear rank, but remain on the wall, astride of it and facing each other; No 3 front rank, assisted by No. 1, then mounts and passes over the wall in rear of No. 2; he is followed by any officer or petty officer in like manner who is to mount with the squad; No. 1 then jumps, with hands extended, toward the men on the wall, who stoop toward him and grasp his wrists with the left and right hands respectively. Having grasped hands, No. 1 should thrust himself out from the wall and walk up it, assisted by the men on the wall, helping himself, also, by engaging one leg over the top. All then drop to the ground on the far side, take their rifles, and assemble in the desired formation, or scale the next wall to the front.

10–73. The preliminary instruction should be given without arms.

Great care must at all times be taken to see that rifles are not dropped or broken. As efficiency is gained, men may be required to scale the wall in light marching order, and finally fully equipped.

10–74. A well-trained team lightly equipped, should be able to assemble on the far side of the wall within 25 seconds after the command **mount** has been given.

10–75. If under fire during an advance, no attempt to fire from the top of the wall should be made. The far side should first be observed by an officer or petty officer; the rear rank when ordered, will then pass over quickly as prescribed; take extended order prone, and cover, with their fire, the front rank while they mount.

10–76. Retirement under similar circumstances is somewhat more difficult. The rear rank deploy and facing the enemy cover the front rank with their fire. The front rank rest their rifles against the wall; Nos. 2 and 4 assisted by Nos. 1 and 3, then mount the wall and remain on top. No. 3, assisted by No. 1, mounts and passes over the wall in rear of No. 2; No. 1 then passes the rifles to Nos. 2 and 4, who pass them on to No. 3. No. 1 then mounts and passes over, assisted by Nos. 2 and 4. Nos. 2 and 4 then step on the shoulders of Nos. 1 and 3, or, if necessary, remain on the wall, and receiving their rifles, open fire over the top of the wall. The rear rank, after the supporting fire has been opened, executes **cease firing**, and mounts and passes over the wall as explained for the front rank.

10–77. When the instruction has progressed sufficiently, blank ammunition should be issued, and the men trained in a simulated advance and retirement when under fire.

10–78. To scale a wall higher than 10 feet, the following pyramid formation may be useful. It is not intended as a maneuver, but requires four men, here numbered for reference, 1, 2, 3, and 4. Lanyards necessary.

Nos. 1 and 2 face each other, and stand with feet apart near the base of the wall, place their right and left hands, respectively, against the wall, and interlock the fingers of their free hands, palms up, forming a stirrup. No. 3 then places his left foot in the stirrup, and springs lightly up, placing his right foot on the left shoulder of No. 1, his left foot on the right shoulder of No. 2, toes pointing to the right, his left hand against the wall; he then turns slightly. No. 4 grasps right hands with No. 3, places his right foot in the stirrup, then his left foot on the left shoulder of No. 2, loosens the grasp of hands, and places his right foot in the right hand of No. 3, who stoops and braces himself; No. 4 next places his left foot on the left shoulder and his right foot on the right shoulder of No. 3, who then slowly straightens up; No. 4 grasps the top of the wall and straddles it. No. 3, assisted by No. 4, throws his left leg over the wall and faces No. 4. Nos. 3 and 4 drop their lanyards to Nos. 1 and 2 who pass up the pieces and then haul themselves up; all then drop to the other side.

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Chapter 11

SMALL ARMS, NOMENCLATURE, CARE, AND TRAINING

Section I.—U. S. MAGAZINE RIFLE, MODEL OF 1903

(Ordnance pamphlet No. 69)

The Assembled Parts and Their Operations

11–1. Most of the operating parts of the rifle may be included under the **bolt mechanism** and **magazine mechanism.**

(1) The **bolt mechanism** consists of the bolt, sleeve, sleeve lock, extractor, extractor collar, cocking piece, safety lock, firing pin, firing-pin sleeve, striker, and main spring.

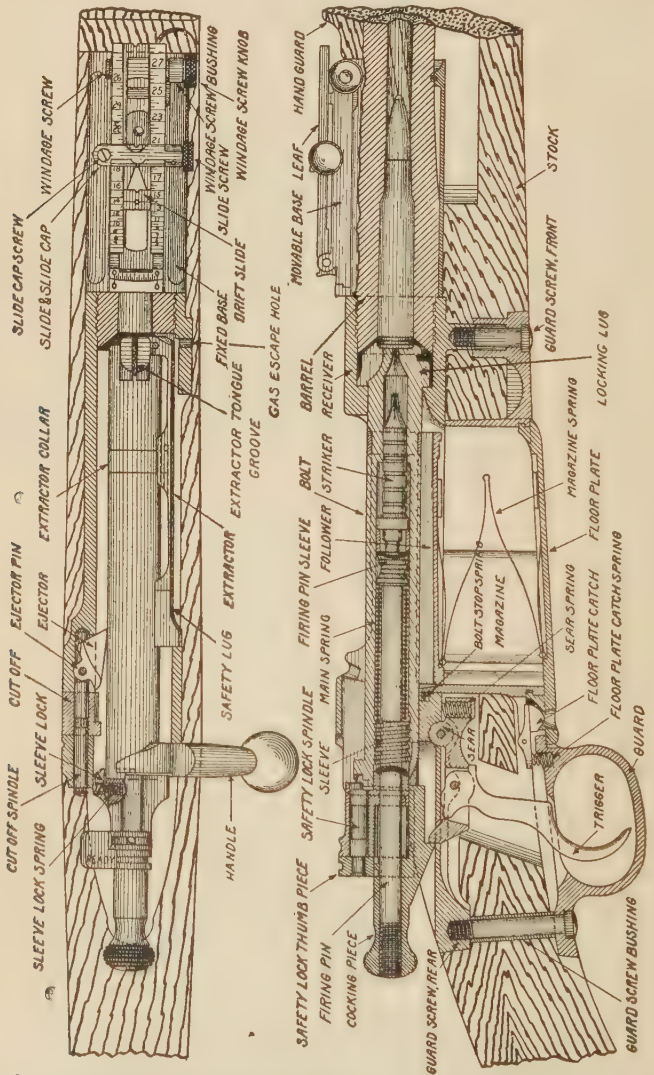

FIG. 144

(2) The bolt moves backward and forward and rotates in the well of the receiver it carries a cartridge, either from the magazine, or one placed by hand in front of it, into the chamber, and supports its head when fired.

(3) The sleeve unites the parts of the bolt mechanism, and its rotation with the bolt is prevented by the lugs on its sides coming in contact with the receiver.

(4) The hook of the extractor engages in the groove of the cartridge case and retains the head of the latter in the countersink of the bolt until the case is ejected.

(5) The safety lock when turned to the left is inoperative; when turned to the right—**which can only be done when the piece is cocked**—the point of the spindle enters its notch in the bolt and locks the bolt; at the same time its cam forces the cocking piece slightly to the rear, out of contact with the sear, and locks the firing pin.

11–2. The **magazine mechanism** includes the floor-plate follower, magazine spring, and cut-off.

11–3. (1) **To charge the magazine,** see that the cut-off is turned up showing "on," draw the bolt fully to the rear, insert the cartridges from a "clip" or from the hand, and close the bolt. To charge the magazine from a clip, place either end of a loaded clip in its seat in the receiver and, with the thumb of the right hand, press the cartridges down into the magazine until the top cartridge is caught by the right edge of the receiver. The manner in which the cartridges arrange themselves in the magazine and the position of the follower and compressed magazine spring are shown in Figure 145. The cartridge ramp guides the

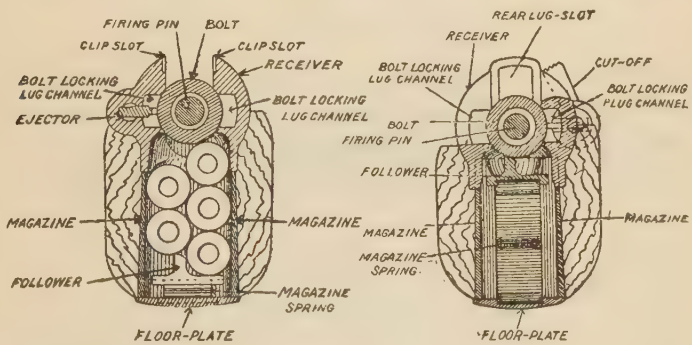

FIG. 145

bullet and cartridge case into the chamber. The magazine can be filled, if partly filled, by inserting cartridges one by one.

(2) Pushing the bolt forward, after charging the magazine, ejects the clip.

The Cut-Off

11–4. (1) **When the cut-off is turned down,** the magazine is "off." The bolt can not be drawn fully back, and its front end projecting over the rear end of the upper cartridge, holds it down in the magazine below the action of the bolt. The magazine mechanism then remains inoperative, and the arm can be used as a single loader, the cartridges in the magazine being held in reserve. The arm can readily be used as a single loader with the magazine empty.

(2) **When the cut-off is turned up,** the magazine is "on"; the bolt can be drawn fully to the rear, permitting the top cartridge to rise high enough to be caught by the bolt in its forward movement. As the bolt is closed, this cartridge is pushed forward into the chamber, being held up during its passage by the pressure of those below. The last one in the magazine is held up by the follower, the rib on which directs it into the chamber.

11–5. In magazine fire, after the last cartridge has been fired and the bolt drawn fully to the rear, the follower rises and holds the bolt open to show that the magazine is empty.

Precautions

11–6. (1) If it is desired to carry the piece cocked, with a cartridge in the chamber, the bolt mechanism should be secured by turning the **safety-lock** to the **right.** Under no circumstances should the firing pin be let down by hand on a cartridge in the chamber.

(2) To obtain positive ejection, and to insure the bolt catching the top cartridge in magazine, when loading from the magazine, the bolt must be drawn fully to the rear in opening it.

(3) When the bolt is closed, or slightly forward, the cut-off may be turned up or down as desired. When the bolt is in its rearmost position, to pass from loading **from the magazine to single loading**, it is necessary to force the top cartridge or follower below the reach of the bolt, to push the bolt slightly forward, and to turn the cut-off down, showing "off."

(4) In case of a **misfire** it is unsafe to draw back the bolt immediately, as it may be a case of **hang fire.** In such cases the piece should be cocked by drawing back the cocking piece.

(5) **It is essential for the proper working and preservation of all cams that they be kept lubricated.**

Dismounting and assembling

11–7. The bolt and magazine mechanism can be dismounted without removing the stock. The latter should never be done except for making repairs, and then only by some selected and instructed man.

TO DISMOUNT BOLT MECHANISM

11–8. (1) Place the cut-off at the center notch; cock the arm and turn the safety lock to a vertical position, raise the bolt handle and draw out the bolt.

(2) Hold bolt in left hand, press sleeve lock in with thumb of right hand to unlock sleeve from bolt and unscrew sleeve by turning to the left.

(3) Hold sleeve between forefinger and thumb of the left hand, draw cocking piece back with middle finger and thumb of right hand, turn safety lock down

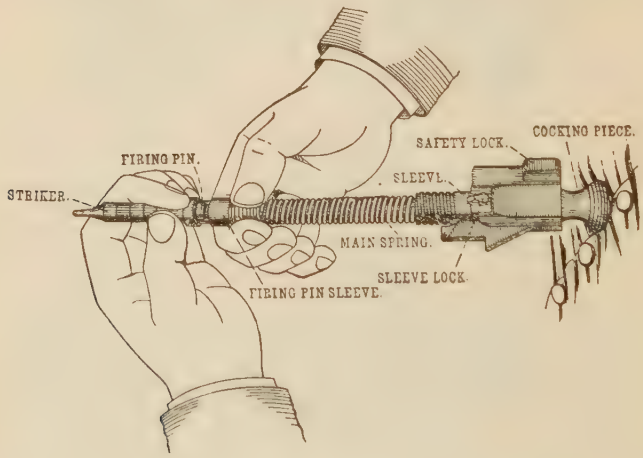

FIG. 146

to the left with the forefinger of the right hand, in order to allow the cocking piece to move forward in sleeve, thus partially relieving the tension of mainspring; with the cocking piece against the breast, draw back the firing-pin sleeve with the forefinger and thumb of right hand and hold it in this position (fig. 146), while removing the striker with the left hand; remove firing-pin sleeve and mainspring; pull firing pin out of sleeve; turn safety-lock thumbpiece to the right on sleeve and draw it to the rear through the groove made in sleeve for this purpose; turn the extractor to the right, forcing its tongue out of its groove in the front of the bolt, and force the extractor forward and off the bolt.

TO ASSEMBLE BOLT MECHANISM

11–9. (1) Grasp with the left hand the rear of the bolt, handle up, and turn the extractor collar with the thumb and forefinger of the right hand until its lug is on a line with the safety lug on the bolt; take the extractor in the right hand and insert the lug on the collar in the undercuts in the extractor by pushing the extractor to the rear until its tongue comes in contact with the rim on the face of the bolt (a slight pressure with the left thumb on the top of the rear part of the extractor assists in this operation); turn the extractor to the right until it is over the right lug; take the bolt in the right hand and press the hook of the extractor against the butt plate (fig. 147) or some rigid object until the tongue on the extractor enters its groove in the bolt.

(2) Place the safety lock, through the dismounting groove, into position on the sleeve and turn it down to the left so as to permit the firing pin to enter the sleeve as far as possible; place the cocking piece against the breast and put on mainspring, firing-pin sleeve, and striker. (See fig. 146.) Holding the cocking piece between the thumb and forefinger of the left hand, draw the cocking piece back with thumb and middle finger of the right hand, and turn the safety lock

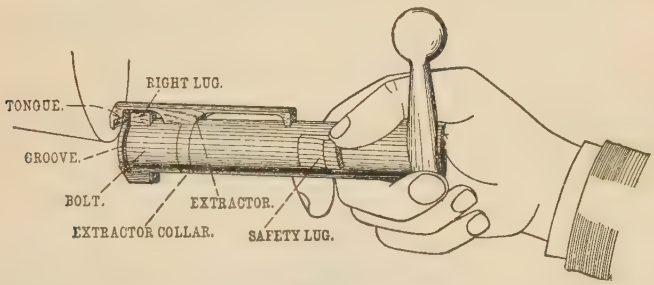

FIG. 147

to a vertical position with the forefinger of the right hand; insert the firing pin in the bolt and screw up the sleeve (by turning it to the right) until the sleeve lock enters its notch on the bolt.

(3) See that the cut-off is at the center notch; hold the piece under floor plate in the fingers of the left hand, the thumb extending over the left side of the receiver; take bolt in right hand with safety lock in a vertical position and safety lug up; press rear end of follower down with left thumb and push bolt into the receiver; lower bolt handle; turn safety lock and cut-off down to the left with right hand.

TO DISMOUNT MAGAZINE MECHANISM

11–10. (1) With the bullet end of a cartridge press on the floor-plate catch (through the hole in the floor plate), at the same time drawing the bullet to the rear; this releases the floor plate.

(2) Raise the rear end of the first limb of the magazine spring high enough to clear the lug on the floor plate and draw it out of its mortise; proceed in the same manner to remove the follower.

(3) To assemble magazine spring and follower to floor plate, reverse operation of dismounting.

(4) Insert the follower and magazine spring in the magazine, place the tenon on the front end of the floor plate in its recess in the magazine, then place the lug on the rear end of the floor plate in its slot in the guard, and press the rear end of the floor plate forward and inward at the same time, forcing the floor plate into its seat in the guard.

Ballistics

11–11. Charge: About 50 grains pyro-cellulose smokeless powder. Bullet: Weight, 150 grains, cupro-nickel jacket. Muzzle velocity: 2,700 feet per second. Energy of free recoil: About 15 foot-pounds. Maximum range: About 5,465 yards at 45° elevation. Time of flight: 31.36 seconds.

Range table

	200 yards	500 yards	800 yards	1,000 yards	1,500 yards
Angle of elevation	0° 5′	0° 16′	0° 32′	0° 48′	1° 47′
Time of flight (seconds)	0.24	0.71	1.31	1.9	3.5
Remaining velocity (feet per second)	2,245	1,668	1,238	1,068	852
Maximum ordinate (feet)	0.24	2	7.3	14.5	52.8
Distance from muzzle (yards)	104	271	452	581	885

Penetration table

Material	Penetration			
	50 feet	100 yards	500 yards	1,000 yards
	Inches	*Inches*	*Inches*	*Inches*
White-pine butts, made of 1-inch boards, placed 1 inch apart	33.5	46.7	24.3	12.8
Moist sand	8.7	----------	13.4	12.5
Dry sand	4.0	----------	9.2	7.5
Loam practically free from sand	14.0	----------	18.8	18.6
Low steel plate 0.493 inch thick	.45	.26	----------	----------
Low steel plate 0.384 inch thick	Through.	Through.	----------	----------
High steel plate 0.385 inch thick	Through.	.24	----------	----------
Seasoned oak across grain	12.2	33.6	----------	----------
Brick wall	----------	5.0	----------	----------

THE RIFLE

11–12. The instructor should explain the use of the rear sight and of the principal operating parts, such as the bolt and the magazine mechanisms, especially the safety lock and magazine cut-off, how to remove the bolt and floor plate. He should dismount, clean, and reassemble all parts carried in the bolt and magazine, and require each man to do the same; point out and name the principal parts and cause the men, first, to point out each part as it is named; second, to name each part as it is pointed out.

11–13. Precautions.—Unless the bolt is drawn fully back the ejector will fail to work, and in magazine fire it will cause a jam.

When a misfire occurs, press the bolt handle well down, pull the cocking piece to the rear, and try again. Unless the bolt handle is fully down the firing pin does not strike with full force. Almost all misfires are due to this fault.

See that the guard screws are kept tight. Loose guard screws not only prevent good shooting, but also interfere with the proper feeding of cartridges from the magazine, often resulting in a jam.

For practicing the motions of rapid fire with the rifle unloaded, turn the cut-off down or "off," otherwise the bolt can not be worked back and forth.

11–14. The rifle is a weapon of precision, and demands proper care and cleaning. A lack of care soon ruins its accuracy.

After a day's shooting the bore demands special attention, as the residuum from smokeless powder soon corrodes it, and should be removed as soon as practicable.

There are three kinds of fouling:

(1) A black deposit, easily removed by oily rags.

(2) An acid deposit or gas, forced into the texture of the steel, which gradually comes out, and, unless removed, causes rust. Cleaning must be repeated daily for several days.

(3) Metal fouling, caused by particles of the cupro-nickel jacket of the bullet adhering to the bore. This rarely happens with the present ammunition, and its removal is usually not only impracticable in the field, but unless done by an experienced man may cause serious damage to the bore.

11–15. To clean the rifle.—(1) Remove the bolt and clean from the breech end. **Never clean from the muzzle.**

(2) Use a cleaning rod and small pieces of cloth about 1½ inches square, then lightly oil the bore by using an oiled rag. The metal and working parts are also cleaned by using dry rags, and then oiling with a slightly oiled rag to prevent rusting and to lubricate working parts.

(3) **No more oil than this light oiling should be used,** because any surplus oil makes the rifle disagreeable to handle, collects dirt and grit, finds its way into and around the bolt mechanism and often flies back into the firer's face and eyes, when he fires. The bolt handle should be dry and entirely free from oil, otherwise in operating the bolt it is difficult to grasp firmly.

(4) If available, a saturated solution of soda and water may be used to clean the bore, thoroughly drying the bore with dry patches before oiling. Or the following mixture may be used: Amyl acetate, 2 parts; acetone, 2 parts; gas engine oil, 1 part. Dissolve the oil in the acetate and add the acetone.

(5) Whatever the method of cleaning, the bore should be cleaned daily for several days.

(6) Cosmoline, machine oil, or any other oil which will not rust the metal is suitable for oiling rifles. Sperm oil is the best for lubricating metallic bearing and contact surfaces, a somewhat heavier oil for the bore. Never use emery or any other material which will scratch the metal.

(7) The stock and hand guard may be coated with raw linseed oil and polished by rubbing with the hand.

Section. II.—AIMING

11–16. There are several different open-sight notches on the rear sight, but **the peep sight is recommended for all firing.**

In **aiming,** the eye should be held as close as possible to the peep; that is almost up to the comb of the firing pin. Then aim at the point it is desired to hit, **keeping the top of the front sight centered in the peep hole,** as shown in Figure 148. **But when the target (or bull's-eye) appears ill-defined, or so small as to be masked by the front sight,** aim should be taken at the **lower edge** of such target or bull's-eye, since an exact aim is very difficult to maintain when the target is even temporarily obscured, and a wild shot becomes probable.

With any open sight always aim so that the front sight is centered on the rear-sight notch, and just "fills" the notch, *i. e.*, is just even with the top of the

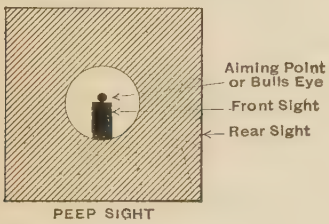

FIG. 148a

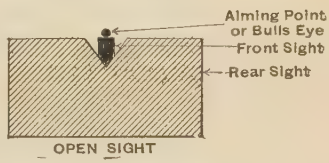

FIG. 148b

rear-sight notch, as shown in Figure 148. Then aim at the point it is desired to hit, or, if the target is small, let it rest on top of the front sight, in the manner explained for the peep sight.

The battle sight (open sight with sight leaf down) is the only kind of open sight which, because of sudden and unexpected emergency in the field, may have to be used. The battle sight is ranged for 530 yards, and consequently shoots high at all ranges within this distance. Hence with this sight aim about 1 foot below the object, at 200 and 400 yards, and 2 feet below at 300 yards; otherwise the shots will be high.

In firing at living targets, except at very short ranges, **aim should be taken at the bottom of the target.** Thus in aiming at a man at long range, at least half of the body of the man (if standing) should be seen resting on the front sight, or all if he is prone.

In firing against moving targets, it will be necessary to lead the target in order to make a hit, as otherwise the shot will fall behind.

The following table shows the approximate distance necessary to aim ahead of the body of a man or horse moving across the range at various distances and various rates of speed:

Distance (yards)	Man walking	Man double timing	Horse walking	Horse trotting	Horse running
100	Front edge	0.5 foot	Front edge of body.	Front edge of body.	Front edge of body.
200	0.7 foot	1.7 feet	do	do	1.3 feet.
300	1.5 feet	3.0 feet	do	1.5 feet	3.8 feet.
400	2.0 feet	4.4 feet	do	3.3 feet	6.5 feet.
500	3.0 feet	6.0 feet	1.0 foot	5.3 feet	9.5 feet.
600	4.0 feet	7.5 feet	2.0 feet	7.5 feet	13.0 feet.

11–17. Blackening the sights.—In all preparatory exercises involving aiming and in all range firing, both sights of the rifle will be blackened. The blackening is done by holding each sight for a few seconds in the point of a small flame which is one of such a nature that a smooth uniform coating of lampblack will be deposited on the metal. There are a number of materials which give a flame of the right nature for this purpose. Among the most commonly used are: A candle, a piece of camphor, a wax match, a piece of pine wood full of pitch, a small piece of shoe paste, a rag saturated with any kind of oil. Some device must be provided to protect the flame from the wind.

Sight Setting

11–18. The marks opposite the peep indicate where the sight is to be set. The numbers on the sight leaf refer to the marks **below** the numbers; for example, the figure 6 is **above** the 600-yard mark. Changes in elevation of 25, 50, and 75 yards have to be made, and when there are no marks for these settings they have to be estimated, and with great care, for a slight inaccuracy makes a big difference in the point of hit.

11–19. The marks on the wind gauge are called points, and changes in windage of quarter points may have to be made.

The bullet is carried in the same direction that the sights are moved; for example, if shots strike above and to the right of the bull's-eye the elevation should be lowered and the windage set to the left. Winds carry the bullet to the right or left with the wind, therefore the windage is set to windward.

11–20. The elevation is not always set at exactly the actual range at which the firing takes place. With some rifles the elevation is set above the range, and with others below it, and all rifles are not exactly true for windage.

To teach sight setting it is not sufficient to explain it to the men. They must be practiced in it.

Section III.—HOLDING THE RIFLE

11–21. Men should not be permitted to fire left-handed. Left-handed men interfere with others on the firing line unless they use their rifles in the normal manner, and the ability to fire right-handed can be readily acquired with a little practice.

The Sling

11–22. Gun sling.—The gun sling is of great assistance in shooting. It helps to steady the rifle, presses the butt of the rifle against the shoulder with the same amount of force for each shot, and reduces the effect of the recoil.

Each man will be assisted by the instructor in adjusting his sling which will be habitually carried with this adjustment. The gun sling will be tightened by means of the lower loop for drill or parade purposes without changing the adjustment of the upper loop. In a firing position, the sling should be as tight as it can be made and still allow the man to get into it readily. A properly adjusted sling will feel uncomfortable until the muscles of the arm become accustomed to the pressure.

There are two authorized methods of adjusting the sling—the "loop" adjustment and the "hasty sling" adjustment. The hasty sling is more rapidly

adjusted than the loop sling, but it gives less support in positions other than the standing position. In range firing the loop sling will be used at all ranges except 200 yards standing. The hasty sling will be used on the range in the standing position at 200 yards. Instruction will be given in both sling adjustments. All men will be required to use one or the other form of gun-sling adjustment when firing or simulating fire in all problems and maneuvers.

(1) *The loop adjustment.*—(See figs. 149 and 150.)
- (*a*) Loosen lower loop.
- (*b*) Put left arm through upper loop from right to left, so that the upper loop is near the shoulder and well above the biceps muscle.
- (*c*) Pull leather keeper down so that it will hold the upper loop in place.
- (*d*) Move the left hand over the top of the gun sling and grasp the rifle near the lower band swivel so as to cause the sling to lie smoothly along the hand and wrist.
- (*e*) Lower loop, not used in this adjustment, will be so loose as to prevent any pull upon it.

(2) *The hasty sling adjustment.*—
- (*a*) Loosen the lower loop.
- (*b*) Grasp the rifle just in rear of the lower band swivel with the left hand and grasp the small of the stock with the right hand.
- (*c*) Throw the sling to the left and catch it above the elbow and high on the arm.
- (*d*) Remove the left hand from the rifle, pass the left hand under the sling, then over the sling and regrasp the rifle with the left hand so as to cause the sling to lie along the hand and wrist.

FIG. 149

The sling may be given one half turn to the left and then adjusted. This twisting causes the sling to lie smoothly along the hand and wrist. (See fig. 151.)

FIG. 150.—To loop adjustment of the sling

FIG. 151.—The hasty sling adjustment

The Standing Position

According to the latest practice the firer stands half-faced to the right; feet from 1 foot to 2 feet apart; body erect and well balanced; left elbow well under the rifle; left hand grasping the piece in front of the balance, rifle resting on the palm of the left hand which grasps the piece in front of the balance; butt of the piece high up on the shoulder and firmly held; right elbow approximately at the height of the shoulder; cheek pressed against the stock and placed as far forward as possible without strain. (Fig. 152.) A position with the left hand against or under the trigger guard and with the left upper arm supported against the body is prohibited in national matches. (Fig. 153.) There are, however, various ways of holding the rifle in the standing position. The left hand may be drawn back from the lower band swivel to near the trigger guard. The left arm should rest against the body. The standing position is the most unsteady position and much practice with the rifle unloaded is necessary to cultivate steadiness. Do not be afraid in this position to press the jaw hard against the stock. The head then goes back with the recoil and the face is not hurt. Do not try to meet or resist the recoil. Let the body yield to it.

Some men may find they can hold the rifle more steady in the standing position, especially at rapid fire, by throwing practically the entire weight of the body on the left leg, keeping the left knee straight, and throwing the left hip

out in the direction of the line of fire. The right knee is slightly bent, the right leg merely serving to steady the body. With the body in this position better support is afforded for the left elbow and arm, which should be held close against the body. The right elbow should be held level with the line of sight. Instead of using the loop of the sling around the arm as in all other positions the hasty

FIG. 152.—Approved standing position

FIG. 153.—Standing position

sling should be used in the standing position. The sling must be kept well up under the armpit, thus holding the sling taut across the chest.

On discharge of the piece it will be found that the shock of recoil will be taken up entirely by the sling instead of the shoulder.

This method of using the sling also allows free movement of the right arm and shoulder for operating the bolt in rapid fire so that the piece need not be taken down from the aiming position between shots.

The Squatting Position

11–23. Both feet are flat on the ground and the buttocks clear of the ground. Bend the knees and lower the body, resting both elbows on the knees, the points

FIG. 154.—Squatting position

of the elbows over the knees. This position is comfortable, steady, and quickly taken. (Fig. 154.)

The Kneeling Position

11–24. The firer kneels half-faced to the right on the right knee, sitting on the right heel; the left knee bent so that the left lower leg is vertical; left arm well under the rifle and resting on the left knee with the point of the elbow

FIG. 155.—Kneeling position

FIG. 156.—Kneeling position, sitting on side of right foot

beyond the kneecap. There is a flat place under the elbow which fits a flat place on the knee and makes a solid rest. The right elbow is approximately at the height of the shoulder; cheek pressed firmly against the stock and placed as far forward as possible without strain. The firer should lean well forward. Sitting on the side of the foot instead of the heel is authorized.

The Sitting Position

11–25. The firer sits half-faced to the right; feet well apart and well braced on the heels, which are dug slightly into the ground; body leaning well forward;

FIG. 157.—Approved sitting position

FIG. 158.—Sitting position, legs crossed

FIG. 159.—Kneeling behind parapet

both arms resting inside the legs and well braced; cheek pressed firmly against the stock and placed as far forward as possible without straining; left hand near the lower band swivel, the rifle resting on the palm of the hand.

The sitting position is used in the field when firing from ground that slopes downward to the front. In practicing this position the feet may be slightly lower than the ground upon which the firer sits. Sitting on a low sandbag is authorized except in match firing.

FIG. 160.—Sitting behind parapet

There are several varieties of the sitting position; every man must find the one which fits him best. Inexperienced men sometimes find difficulty in adjusting themselves to this position, but with practice it becomes comfortable and steady. The legs must be at rest and the leg muscles not strained when aiming. Lean the body well forward and find a steady rest on the knees for both elbows.

Crossing the feet in the sitting position is no longer allowed in national matches but in the field such a position allows the firer to rise more quickly.

The Prone Position

11–26. Lie flat down at an angle of about 45° to the firing line, spread the legs wide apart, and turn the heels inboard. Flatten the middle part close to the ground.

FIG. 161.—Placing the butt of rifle in right shoulder

Place the point of the left elbow to the front, and well to the right, then raise the right shoulder and placing the right hand on the butt plate put the butt of the rifle against the shoulder, and flatten out again. Put the cheek or jaw

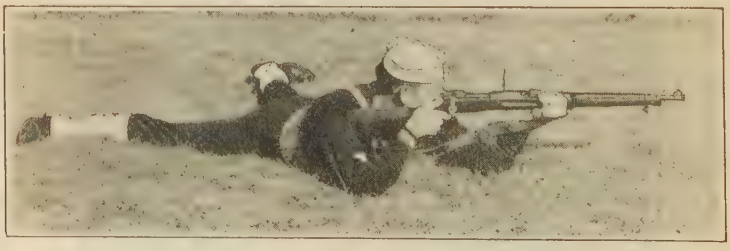

FIG. 162.—Prone position

hard against the small of the stock, the thumb of the right hand along and not across the stock, and the right eye up to the firing pin, as close to the peep sight as possible. Let the right elbow spread out, and drawing the body back, get the

chest and the whole body as flat on the ground as possible. The left elbow must be directly under the rifle. The right elbow is moved **out** to raise and **in** to lower the muzzle. Now the rifle can not kick. The only recoil will be of the whole body, which will not be felt.

The elbows should not be unduly spread apart, because such separation results in an unsteady position and brings the chest so near the ground that the neck has to be strained backward in order to see through the sights. This strained position of the neck interferes with good vision and tends to make the firer unsteady. The exact angle of the arms to the ground will depend somewhat upon the conformation of the man. The right elbow should be so placed that the right upper arm will not form an angle of less than 45° with the ground.

The exact position of the left hand will depend on the length of arm and width of chest of the individual. It should be as near the lower band swivel as the conformation of the man will permit. The left hand will never be placed against, or near, the trigger guard.

Artificial Rests

11–27. The use of artificial rests adds steadiness in aiming. In the standing position, a tree or post may be used. Shoot from the right of the post, resting either the rifle or arm against the post. In firing from behind a parapet, any of the positions may be used, depending on the height of the parapet.

Section IV.—GENERAL PRINCIPLES FOR FIRING IN ALL POSITIONS

11–28. Press the cheek hard against the stock.

Thumb is along, and not across, the stock.

Never cant the rifle. Keep it plumb. If it is canted the least bit the bullet will strike in the direction of the cant.

Breathe out naturally and then do not breathe while aiming.

If you aim too long you will become unsteady and your eyesight will get bad. Take the rifle from the shoulder, rest, and aim again.

Squeeze the trigger. There is a little slack in the trigger. When aiming take this up with the finger so that when you wish to fire you have only to increase the pressure of the finger.

Before firing, cock the rifle, and with the rifle unloaded squeeze the trigger. This will steady you down and get you better acquainted with your trigger pull.

Do not yank or pull the trigger; squeeze gently the whole small of the stock with the right hand. Let the trigger off as easy as you can, and keep up the aiming while the gun is being discharged, then you can tell where you were aiming when the bullet left the rifle.

Call the shot. As soon as you have squeezed the trigger, and before the target is marked, "call the shot," that is, call out loud where you were aiming when the trigger was squeezed and when the bullet left the rifle.

A man who intends to call the shot will not shut his eyes when he squeezes the trigger; he will not quit aiming while he is squeezing the trigger. He will not flinch. Calling the shot is the best cure for flinching. Make up your mind to continue aiming while the piece is being fired. Calling the shot will help you do all these things.

11–29. In rapid fire keep the butt to the shoulder. To load, lower the muzzle to the right and work the bolt, being careful to draw it fully back, so it will eject the empty shell and not cause a jam. It will become easy after practice.

In reloading prone with the rifle resting on a parapet and without removing the butt from the shoulder raise the right elbow well above the ground. It requires practice to do this conveniently.

Notes on Wind

11–30. The direction of winds is expressed by use of the word "o'clock." A wind coming directly from the target is a 12 o'clock wind. A wind blowing directly toward the target is a 6 o'clock wind. Both 12 and 6 o'clock winds, also winds from about 11, 1, 5, and 7 o'clock are called **fish-tail winds.** Winds from the firer's right as he faces the target are 3 o'clock winds, and from the left 9 o'clock winds. Both 3 and 9 o'clock winds and also 2, 4, 8, and 10 o'clock winds are called **cross winds.**

11–31. At the shorter ranges, winds do not affect the bullet much. The direction of winds is never steady, and at the longer ranges the slightest

change in direction of fish-tail winds causes great effect in lateral deviation of the bullet. Considerable change in direction of cross winds causes very little effect in lateral deviation of the bullet, and even if they are strong winds they are favorable conditions for shooting.

The Windage Rule

(How to calculate the windage required)

11–32. Range, in hundreds of yards, times velocity of wind, in miles per hour, divided by 10 equals number of quarter points of windage required for 3 or 9 o'clock winds. Winds 1 hour away from 3 or 9 o'clock—that is, 2, 4, 8, 10 o'clock winds—require only slightly less winadge; winds 1 hour away from the 12 or 6 o'clock line—that is, 11, 1, 5, and 7 o'clock winds—require about half as much windage as the 3 or 9 o'clock winds.

If trees or other objects obstruct the wind the effect of the wind on the bullet is less than if the wind is unobstructed, and this must be allowed for in estimating windage.

The Quarter Point Rule for Changing Windage

(How to change windage in slow fire after hitting the target)

11–33. Changing the windage ¼ point moves the bullet 1 inch for every 100 yards of range. For example:

¼ point at 200 yards moves the bullet 2 inches on the target.
¼ point at 300 yards moves the bullet 3 inches on the target.
¼ point at 400 yards moves the bullet 4 inches on the target.
¼ point at 500 yards moves the bullet 5 inches on the target.
¼ point at 1,000 yards moves the bullet 10 inches on the target.

The Square Rule for Changing Elevation

(How to change elevation after hitting the target)

11–34. Changing the elevation 100 yards at any range gives change on the target equal to the number of inches in the square of the range.

Example: At 200 yards changing the elevation 100 yards gives 4 inches change on the target; at 300 yards, 9 inches; 500 yards, 25 inches; 600 yards, 36 inches; 1,000 yards, 100 inches.

This rule is not exact, but is close enough for all purposes.

11–35. Do not make changes in windage or elevation boldly. Make a little less change than what the rules would call for. In practice, changes seem to carry the bullet more than expected. Change cautiously. In case of doubt favor the smaller change, and unless quite sure of the hold or pull, or unless changes in conditions suggest it, do not change for one shot a little off.

Always aim the same way and control the point of hit by changing elevation and windage.

Finding the Target

11–36. If the target is not hit by the first shot the trouble is probably in elevation, because any error in estimating the windage should not be sufficient to carry the shot off the target. To find the target, make changes in elevation of 50 yards at a time. Often misses are the result of neglecting to set the sight or of the sight slipping down. First examine the sight and see that the windage has been set on the correct side, and then if you have made no mistakes you should begin by coming down at long range 50 yards, then if you miss again come up 50 yards from the original elevation, and so on until you find the target.

Weather Conditions

11–37. There are two conditions which considerably affect elevations at long range; they are light and what is called by riflemen mirage. Their effect is not noticeable at short ranges, and is small at mid-ranges (500 and 600 yards), but is considerable at long ranges (800 and 1,000 yards). The effect on elevations of head and tail winds is noticeable at 1,000 yards and strong winds require an allowance of not over 25 yards at 1,000 yards. Higher elevation is required for head winds and lower elevation for tail winds.

11–38. Light.—A change in conditions from bright light (sunshine) to dull light (cloudy) requires changes in both elevation and windage.

If you are shooting in a dull light and the sun comes out, your shots will then strike low, and if the sun is to the right your shots will also strike to the left, or, if the sun is to the left, your shots will also strike to the right.

The effect of light must therefore be compensated for, and the rule is to move your sight into the sun both for elevation and windage. In other words, if shooting in a dull light and the sun comes out, raise your elevation and move the windage to the right if the sun is to the right or to the left if the sun is to the left.

The amount of change to make for sunlight has been found by practical experience to be from ¼ to ½ point of windage and about 25 yards in elevation.

A good plan for mid and long range slow fire, when shooting in changing lights, is to wait as much as possible and try to fire your shots under the same light conditins.

11–39. Mirage.—What is called **mirage** by riflemen is not true mirage, but is the heat waves often noticed with the naked eye, but more clearly seen with the telescope. It is really the air traveling on the range. It is the best guide for windage, because as seen through the telescope directed at the target it is the actual air through which the bullet travels, while flags may show currents of air moving in other directions. When the mirage and flags do not agree, which is often the case on the range, the mirage is the true guide.

The ability to use the mirage skillfully in shooting is what distinguishes the real long-range rifleman from the novice. Strong winds dispel mirage. The information obtained from the mirage is more valuable when the wind is light, and especially when it is fish-tailing; that is, shifting from one side to the other.

11–40. Heavy mirage calls for higher elevation.—A heavy mirage causes a wavy appearance of the target, making the bull's-eye appear to be drawn out and down, and consequently higher elevation is required.

When the wind is fish-tailing the mirage changes direction; that is, sometimes moves to the right and sometimes to the left. When there is no movement to the right or left, the wind is either still for the moment or the wind is carrying the mirage directly toward or from the target. The mirage then appears to rise and is said to be "boiling." Try to avoid shooting in a "boil," for this is when the elevations are more disturbed and you are liable to get a miss (below the target). This accounts for some misses which inexperienced shooters are apt to call "unaccountables." The mirage "boils" just as it changes direction from right to left or from left to right. Wait for the mirage to take a movement to the right or left; it never "boils" long. A light mirage which is not in a "boil" does not appreciably affect elevation.

Section V.—THE PISTOL

(Ordnance pamphlet No. 68)

Mechanism of the Pistol

11–41. To thoroughly familiarize men with the mechanism of the pistol they should be required to dismount and assemble its parts under an instructor in the manner prescribed for the rifle, article **11–12**. This may be done without tools.

To dismount: Remove the magazine by pressing the magazine catch.

Press the plug inward and turn the barrel bushing to the right until the plug and the end of the recoil spring protrude from their seat, releasing the tension of the spring. In carrying out this operation, the finger should be held over the plug to prevent it from jumping away; then remove the plug.

Draw the slide rearward until the smaller rear recess in its lower left edge stands above the projection on the thumb piece of the slide stop; press gently against the end of the pin of the slide stop, which protrudes from the right side of the receiver above the trigger guard and remove the slide stop. This releases the link, allowing the barrel, with link and slide to be drawn forward together from the receiver, carrying with them the barrel bushing, recoil spring, and recoil-spring guide. Remove these parts from the slide by withdrawing the recoil-spring guide from the rear of the recoil spring; then draw the recoil spring forward from the slide.

Turn the barrel bushing to the left until it may be drawn forward from the slide; this releases the barrel which, with the link, may also be drawn forward from the slide.

Partial dismounting of the pistol, as indicated in the preceding paragraphs, is all that is required ordinarily for proper care and cleaning. Only experienced men should be permitted to dismount other parts of the pistol.

To assemble: Assemble the parts in the reverse order from that given for dismounting.

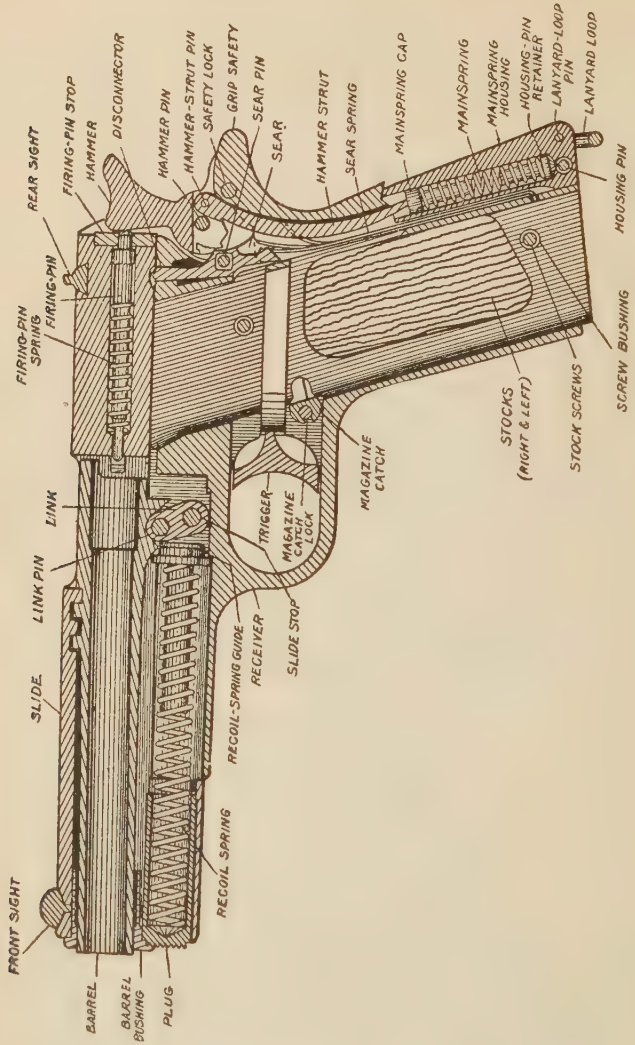

FIG. 163

Care and Handling

11–42. When the slide is in its forward position and the hammer is full cocked push the safety-lock up to lock the hammer.

11–43. The grip safety at all times automatically locks the trigger unless the grip safety is pressed in by firmly grasping the handle as in the firing position.

When the slide is drawn fully back to its rear position, if the magazine is empty the slide stop automatically locks the slide in its open position; if the magazine is not empty, and there is no jam, the slide when released will spring to its forward position unless it is locked by pressing the slide stop up into the recess on the slide.

When the pistol is fired and the slide remains open, it indicates either that the magazine is empty or that there is a jam.

To relieve a jam it is often necessary to remove the magazine.

To remove the magazine, press the magazine catch.

11–44. To load, charge the magazine with any number of cartridges from one to seven (with five for a string in the Navy courses); insert the magazine into the hollow of the handle with a quick continuous movement until the click of the magazine catch is heard; then draw the slide fully back and release it, thus cocking the pistol and bringing the first cartridge into the chamber. The pistol is now ready for firing.

11–45. With the magazine empty, the pistol can be used as a single loader by drawing back the slide, inserting a cartridge in the chamber, and pressing down the slide stop to release the slide.

11–46. After the pistol is single loaded (and locked as a safety precaution), a filled magazine may be inserted; the pistol then carries eight cartridges ready for use.

It is dangerous, however, to carry the pistol thus loaded, and except in emergencies, the pistol should be carried with the chamber empty. When cartridges are in the magazine, to cock, load the chamber, and fully prepare the pistol for use it is only necessary to draw the slide fully to the rear and release it.

11–47. Pressure must be entirely relieved from the trigger after each shot in order that the trigger may reengage the sear.

11–48. To inspect a pistol to see that it is unloaded, or to unload it, draw the slide to the rear and release it as often as is necessary until it automatically remains in the open position. If loaded, each time the slide is drawn to the rear a cartridge will be ejected.

The Revolver

11–49. With the revolver, to load, unload, or inspect it to see whether it is loaded hold the revolver in the left hand, cylinder in the palm of the hand, muzzle pointing to the front or in a safe direction; unlatch and open the cylinder. In closing the cylinder press it home smartly until it clicks, and then verify latching by pressing against the right side of the cylinder. The revolver is injured and often disabled by attempting to operate the trigger or hammer when the cylinder is not fully home and latched. Do not attempt to open the cylinder when the hammer is cocked. With the revolver always, even in rapid fire, use the single action; that is, cock it before firing each shot. The trigger pull of the double action is so heavy that it is impossible to keep the aim in using it. It can be easily cocked by removing the finger from the trigger, raising the muzzle to the right, moving the right hand up on the stock, and placing the thumb across the hammer. This should be practiced until it can be done readily.

When the revolver is to be carried loaded, the chamber under the hammer should always be left empty; otherwise a premature discharge may be caused by a blow on the hammer.

Section VI.—NOTES ON PISTOL SHOOTING

11–50. When a pistol is first taken in hand it should be examined to make sure that it is not loaded.

11–51. Both the front sight and the rear sighting groove should be blackened. When the pistol is aimed the front sight should be seen through the middle of the rear sighting groove and the top of the front sight should be flush with the top of the groove. The part of the target to be aimed at must be determined by practice. With most pistols at 25 yards the aim is usually taken at the bottom edge or in the bottom part of the bull's-eye, and at 50 yards in the center or in the upper part of the bull's-eye.

11–52. Grasp the stock of the pistol as high up as you can so that the barrel, hand, and arm are as nearly as possible in one straight line. The thumb should be extended along the upper part of the frame. The second joint of the forefinger should be on the trigger.

11–53. Start with a light grip and gradually squeeze with the whole hand, the trigger finger squeezing gradually back as the grip is tightened, and continue squeezing without a jerk until the pistol fires. Decide to call the hold and to keep the right eye open.

11–54. If the hits are bunched to one side they can be moved to the right by increasing the pressure of the thumb against the left side of the pistol or to the left by decreasing the pressure.

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FIG. 164.—The standing position

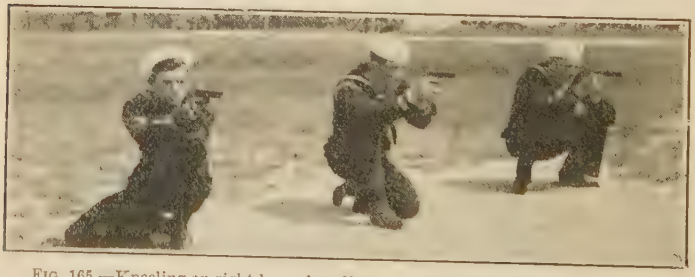

FIG. 165.—Kneeling on right knee; kneeling on left knee; squatting

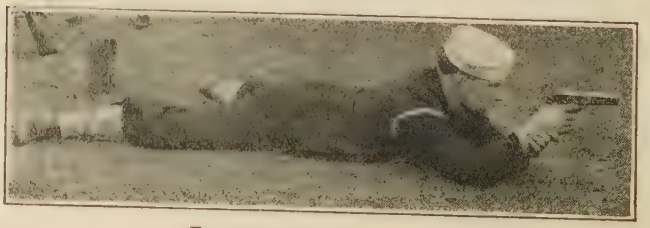

FIG. 166.—Prone with the pistol

11–55. Snapping—that is, aiming and squeezing the trigger with the pistol not loaded—is most valuable practice. No man should load and fire until he has snapped several times to get acquainted with the trigger pull of the pistol. Expert pistol shots do a great deal of snapping instead of a great deal of firing. Steady holding can be acquired only by much snapping practice.

11–56. Positions.—In the prone position the right elbow has excellent support on the ground. In the kneeling position the firer may kneel on either knee. Kneeling on the left knee affords an excellent rest on the right knee for the elbow. In the squatting position both elbows rest on the knees. In the standing position face the target squarely, or nearly so. Stand upright, not craning the head forward, and extend the arm to its full stretch.

Section VII.—ESTIMATING DISTANCE

11–57.—The following information regarding training in estimating distance, and the method of conducting the efficiency test, with the percentage required for qualification in marksmanship in the U. S. Army, is here quoted in order that similar training, when practicable, be carried out in the naval service during shore drills or field exercises and maneuvers.

11–58. Importance.—Ability to estimate distance correctly is an important element in the education of the rifleman.

During the estimating distance drills advantage should be taken of every opportunity to train the rifleman in observing his surroundings from positions and when on the march. He should be practiced in pointing out and naming different features of the ground; in discovering and describing different objects; in counting different objects or beings. Especially should petty officers be trained in describing the location, with reference to other objects, of objects difficult to see and in imparting information of this kind quickly and accurately.

11–59. Distances can be estimated by the eye or by sound; they can be determined by range-finding instruments, by trial shots or volleys, or from maps.

11–60. Estimation of distance by eye.—To estimate distance by the eye with accuracy, it is necessary to be familiar with the appearance, as to length, of a unit of measure which can be compared mentally with the distance which is to be estimated. The most convenient unit of length is 100 yards. To impress upon each man the extent of a stretch of 100 yards, two posts 100 yards apart, with short stakes between to mark each 25 yards, should be placed near the barracks, or on the drill ground, and the man required to pace off the marked distance several times, counting his steps. He will thus learn how many of his steps make 100 yards and will become familiar with the appearance of the whole distance and of its fractional parts.

Next a distance of more than 100 yards will be shown him and he will be required to compare this distance with the 100-yard unit and to estimate it. Having made this estimate, he will be required to verify its accuracy by pacing the distance.

The rifleman should be taught that, in judging the distance from the enemy, his estimate may be corrected by a careful observation of the clearness with which details of dress, the movements of limbs, or of the files in a line may be seen. In order to derive the benefit of this method, each man will be required to observe closely all the details noted above in single men or squads of men posted at varying distances, which will be measured and announced.

11–61. Methods of estimating long distances by the eye.—The following methods are found useful:

(1) Decide that the object can not be more than a certain distance away nor less than a certain distance; keep the estimates within the closest possible limits and take the mean of the two as a range.

(2) Select a point which appears to be the middle point of the whole distance; estimate the half distance and double it, or similarly divide the distance into a certain number of lengths which are familiar.

(3) Estimate the distance along a parallel line, as a road on one side, having on it well-defined objects.

(4) Take the mean of several estimates made by different persons. This method is not applicable to instruction.

11–62. Appearance of objects; how modified by varying conditions of light; difference of level, etc.—During instruction the men should be taught the effect of varying conditions of light and terrain upon the apparent distance of an object.

Objects seem nearer:

(1) When the object is in a bright light.

(2) When the color of the object contrasts sharply with the color of the background.

(3) When looking over water, snow, or a uniform surface like a wheat field.
(4) When looking from a height downward.
(5) In the clear atmosphere of high altitudes.

Objects seem more distant:

(1) When looking over a depression in the ground.
(2) When there is a poor light or a fog.
(3) When only a small part of the object can be seen.
(4) When looking from low ground upward toward higher ground.

11–63. Estimating distance by sound.—Sound travels at the rate of about 1,100 feet, or 366 yards, per second. If a gun is fired at a distance, a certain time elapses before the sound is heard. If the number of seconds or parts of seconds between the flash and the report be carefully taken and multiplied by 366, the product will be approximately the distance in yards to the gun. This method will be of doubtful use on the battle field, owing to the difficulty of distinguishing the sound of the gun whose flash is seen from that of any other. It will probably be useful in determining the range to a hostile battery when it first opens fire.

11–64. Determination of distance by trial shots or volleys.—If the ground is so dry and dusty that the fall of the bullets is visible through a glass or with the naked eye, a method of determining the distance is afforded by using a number of trial shots or volleys.

The method of using trial volleys is as follows:

The sights are raised for the estimated range and one volley is fired. If this appears to hit but little short of the mark, an increase of elevation of 100 yards will be used for the next volley. When the object is inclosed between two volleys, a mean of the elevations will be adopted as the correct range.

The range may be obtained from near-by battery or machine gun. This is the best method where available.

11–65. Estimating distance test.[1]—When instruction shall, in the opinion of the company commander, have progressed to such an extent as to enable the men to judge distances with the eye with fair accuracy, they will be tested for proficiency.

As the danger space is continuous for a man kneeling within a range of 547 yards (battle-sight range), and as individual fire and the fire of small squads will ordinarily be limited to 1,200 yards, men will be tested for proficiency at distances between these two ranges.

The rules governing this test are as follows:

(1) The test will be supervised by an officer.
(2) Each man will be tested separately.
(3) The ground shall be other than that over which he has fired for target practice, or over which he has previously estimated distances.
(4) The use of any device to mark the limits within which distances are tested (570 and 1,200 yards), at the time the test is given, so that this device can be seen from the estimating point, is prohibited.
(5) The objects will be natural objects, men standing, kneeling, or prone.
(6) Five or more natural objects will be selected, or single men or groups of men stationed within the ranges indicated above. The distances of the objectives will not be measured until all who are to estimate on them have made their estimates.

The men to be tested are conducted to a point near that from which the estimates are to be made, and remain facing away from the objectives or hidden therefrom by some feature of the ground. They are not permitted to know what objects are to be used in the test until they are called up to the estimating point.

The officer conducting the test calls up one man at a time, points out to him an object and causes him to estimate the distance thereto. This is continued until the man's estimates on five objectives have been obtained. When the test for the day is completed by any man, he will not be allowed to join the squad awaiting test. After all the men have made estimates of distances to a given series of objectives, ranges thereto will be measured.

(7) Proficiency for the expert rifleman and for the sharpshooter shall consist in making in five consecutive estimates an average degree of accuracy of 90 per cent.

Similarly for proficiency, marksmen, first-class men, and second-class men are required to make in five consecutive estimates an average degree of accuracy of 85 per cent.

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[1] Qualification in estimating distance is not required in connection with the Navy Small-Arms Firing courses and does not affect the qualification attained.

Chapter 12

ARTILLERY

A. Drill

Section I.—GENERAL PRINCIPLES, ORGANIZATION, ETC.

General Principles

12–1. Field artillery in the U. S. Naval Service is normally drawn by man power; and the personnel, whether for the service of the piece or for its transport, have many duties identical with those of infantry, and must, in order to carry out efficiently all their duties, be drilled also as infantry.

12–2. While the artillery organization is designed to permit the ready conversion of artillery units into the corresponding infantry units, and vice versa, artillery should be permanently assigned; otherwise the personnel will be unable to acquire the necessary technical skill for the efficient handling of the guns under the varying conditions of service. This is especially true of guns fitted with panoramic sights and provided with fire-control instruments, in the use of which theoretical knowledge must be supplemented by practice, if the best results are to be attained. (See Art. 15–38.)

Organization and Administration

12–3. The field artillery of a naval force is composed of platoons, companies, battalions, and regiments.

The **platoon** consists of the piece, limber, equipment, gun squad, and dragmen.

The **company** consists of from 2 to 4 platoons; it contains the number of platoons assigned to the organization's normal infantry company, and constitutes the artillery force of a vessel of the first class.

In general, the battalion is composed of the artillery companies of a division of the fleet, or of several vessels, as ordered by the senior officer present. The regiment is correspondingly composed of the artillery battalions of two or more divisions.

12–4. When the drag is manned, the platoon is the smallest unit; but when cleared for action the platoon divides into the gun fully manned. and the dragmen. Artillery, when cleared for action, is said to be **in battery.** The guns of an artillery company together form the **firing battery,** and the combined dragmen form the **supports.** The term **battery,** however, is not restricted to the guns of a single company, but is used to designate any number of pieces, grouped together for the time being, under a single fire-control officer, for firing against a given objective. It is not a tactical unit, and not (under ordinary conditions) a permanent subdivision. It refers primarily to the guns and not to the men; the latter retain their company and battalion organization.

12–5. All units are numbered in sequence within the next higher unit, e. g., second battalion, third company, second platoon.

For purposes of drill and maneuver units will be designated by their temporary relative position in line or column, thus:

The right battery, left battalion;

The leading company, center battalion.

The permanent designation of units does not change as their relative order in line or column is changed, with the following exception:

After the pieces of a company (or battery) are unlimbered and established in line, they are designated from right to left as first piece, second piece, etc., or No. 1, No. 2, etc.

12–6. The number of men required for the gun crew, whatever the type of gun, is the same; and in general they perform the same duties in the service of the piece.

The fire-control detail is a company, not a platoon detail. The number of men required varies according to the equipment provided. The men of this detail (except the musicians) normally form part of the dragmen detachment when the drag is manned, but may be separately organized if desirable.

The strength of the dragmen detachment, normally of three squads, will vary according to requirements. More men are required naturally for the heavier guns or where there is to be actual service in rough country. Whenever practicable for service ashore, horse, mule, or other transportation facilities will always be utilized; but even under these conditions the platoons will be maintained at normal strength.

12–7. Where special equipment is supplied, as for example, a caisson and limber, or motor or animal transportation, such modifications of the drill laid down herein, as may be necessary, are permitted. Unnecessary changes should be avoided.

Duties of officers

12–8. The company commander commands the company in whatever formation the company may be, and normally controls the fire of his guns when in action.

Platoon commanders command their platoons when the drag is manned.

When prepared for action, the senior pt. c. exercises immediate supervision over the firing battery, and commands in case the c. c. is too distant to give his orders by word of mouth. The pt. c. next in rank commands the combined supports. Other pt. cs., if any, may be assigned as reconnaissance officer, assistant to the senior pt. c., or in charge of the supply trains. The company c. p. o. assists the c. c.

12–9. Officers commanding battalions and larger units have duties corresponding to those of similar units of infantry.

When the guns of more than one company are combined for purposes of fire control, the senior c. c. of the guns so grouped becomes fire-control officer of the combined battery.

12–10. When the combined supports are called into action away from the guns, the bn. c. will designate an officer to take charge. Under the conditions of the preceding article, this will normally be the c. c. not engaged in control of fire. Such duty for the supports is to be regarded as exceptional.

Definitions

12–11. The provisions of Infantry Drill Regulations apply except where obviously inappropriate. The following additional definitions are considered essential:

Salvo: A single discharge from each of the guns of a battery, or other unit, fired in regular order from one flank to the other, with intervals of about two seconds.

Volley: The rapid discharge of a certain indicated number of rounds by each gun of a battery, or other unit, each gun firing without regard to the others.

The foregoing definitions differ from their commonly accepted usage in the Naval Service. The differences should be carefully noted, as the definitions are standard for all works on field or land artillery.

Equipment and Characteristics of Guns

12–12. (1) There are at present four different types of 3-inch landing and field guns used by the Navy and Marine Corps. They are the Mark I, mod. 1, field gun of Gun Factory design; the Mark IV landing gun; the Mark VII landing gun, known as the Ehrhardt gun, issued to the Marine Corps; and the Mark XI landing gun.

All of these guns are provided with navy limbers, which serve the double purpose of supporting the trail of piece and carrying ammunition. The Mark VII is sometimes also provided with army caisson and limber.

(2) The distinction between a landing gun and a field gun in our service is primarily one of muzzle velocity, a field gun being of 1,150 foot-seconds and a landing gun of 1,650 foot-seconds. The ammunition is not interchangeable.

	Mark I, mod. 1	Mark IV	Mark VII	Mark XI
Muzzle velocity	1,150	1,650	1,650	1,650
Weight of gun alone	396	576	539	575
Weight of gun and carriage	1,380	1,717	2,249	2,300
Weight of limber	740	620	1,750	550
Number and type ammunition box carried on piece, rounds per box, how stowed in box.	4R-8V	2R-12V	None	None
Same for limber	6R-8V	2R-12H 2F- 6H	9R-8V	2F-20H
Weight of 1 round ammunition	15	16.5	16.5	16.5
Weight of gun and carriage, with full ammunition.	1,860	2,113	2,249	2,300
Same for limber	1,460	1,214	2,938	1,200
Remarks	Open sight, no sliding leaf, 3° train, 10° elevation.	Peep sights, defl. scale in mils, 10° train, 15° elevation.	Panor. sights, gun shield, 2½° train, 18° elevation.	Panor. sights, gun shield, split trail, 45° train, 50° elevation.

F=Fixed.
R=Removable.
H=Stowed horizontally in its box.
V=Stowed vertically in its box.

(3) The general characteristics of the different types are as shown in the table. Further details are given under preparing for action and service of the piece, articles 12–28, 12–29, and 12–69 et seq.

General Rules

12–13. (1) The general rules of Infantry Drill Regulations apply except where obviously inappropriate.

(2) When not engaged in the service of the piece, or as dragmen, the personnel is handled in the same manner as any similar body of infantry.

(3) When the drags are manned, artillery units are maneuvered exactly like corresponding infantry units, and by the same commands, except that the platoon is the smallest unit, and except where otherwise provided in these regulations or obviously impracticable.

(4) The **front**, *when the drag is manned*, is in the direction in which the *trail* points; *when in battery*, it is the direction in which the *muzzle* points. The terms right, left, and rear are with reference to the front so defined. *Front* is also used to designate the direction of the enemy.

(5) The **dress**, when the drag is manned, is on the drag leaders; when in battery, it is on the axles of the pieces.

(6) In simultaneous or successive movements, alignments are preserved according to the rules for infantry.

Ordnance Pamphlets

The following ordnance pamphlets relate to artillery:

124. Three-inch mountain gun, Mark XII.
131. Three-inch landing gun, Mark XI, with carriage and limber.
133. Three-inch range table, I, V, 1,650 f. s. to 6,000 yards, shrapnel.
135. Three-inch breech mechanism, Mark I field guns, Fletcher type.
136. Three-inch range table, I, V, 1,150 f. s. to 4,500 yards, common shell.
137. Three-inch range table, I, V, 1,150 f. s. to 5,000 yards, shrapnel.
146. Handbook of three-inch field guns and landing guns and ammunition and addendum O. D. 241 three-inch H. C. projectile.
147A. Ammunition boxes for three-inch limber, Mark IV.
148A. Ammunition boxes for three-inch field carriage, Mark II and Mark II, Mod. I and limber, Mark I, Mod. 1.
149A. Ammunition boxes for three-inch field carriage, Mark IV, and limber, Mark III.
216. Seven-inch tractor mount, Mark V.
418. Advance base gun platform.

Section II.—SCHOOL OF THE PLATOON

12–14. An artillery platoon consists normally of a pt. c., two 1 p. os., a gun squad and three squads of dragmen; but the number of dragmen may be increased or decreased, depending on circumstances. The members of the gun squad are

assigned, for convenience of designation, numbers from **1** to **8**, the front rank men being 1–4, respectively, and the rear rank men 5–8, respectively; No. 4 is habitually squad leader and gun pointer.

The platoon has three formations, namely: **Platoon to the front, at the drag, and in battery.**

Formation Platoon to the Front.

12–15. The formation is that of a platoon of infantry, gun squad on the left. (See fig. 167.) Pieces are at the order unless otherwise directed.

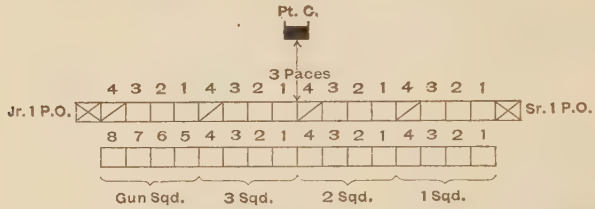

FIG. 167.—Formation platoon to the front

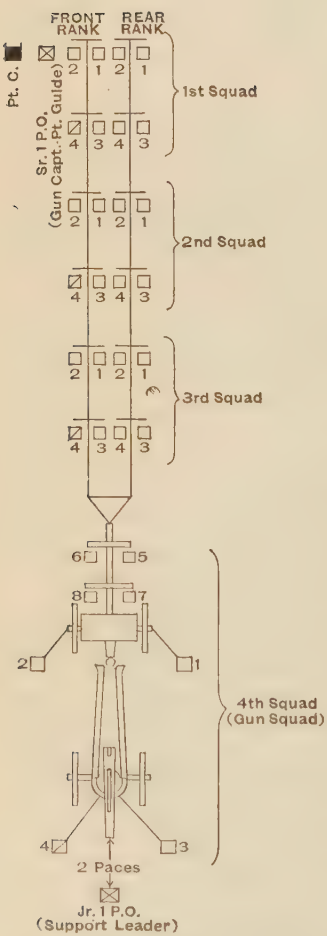

FIG. 168.—Formation at the drag

Formation at the Drag

12–16. (1) The drag consists of a span and cross bar, 3½ feet long, with two dragropes. Each dragrope is fitted with 4 or 6 toggles, 5 feet apart, and may be lengthened by fitting extension pieces, with toggles, or shortened by stopping back one or two toggles. The span and each dragrope are fitted with snap hooks, which hook into appropriate thimbles, so that if desired either dragrope may be used alone, without the span, or both combined to make a single drag of double lengths.

(2) The double drag is the normal formation. The front rank mans the left dragrope, rear rank the right dragrope; even numbers on the left of the drag, odd numbers on the right; each squad intact.

(2) The double drag is the normal formation. The front rank mans the left dragrope, rear rank the right dragrope; even numbers on the left of the drag, odd numbers on the right; each squad intact. Stations of individuals are shown in Figure 168. The senior 1 p. o. is abreast of the drag leaders, the junior 1 p. o. is 2 paces in rear of the piece. The pt. c. is on the left of the platoon guide.

(3) Pieces for all p. os. and men are carried at the diagonal sling (Art. 12–20); but dragmen may be directed to carry the piece in the free hand, or at the right or left shoulder, according as they are on the right or left of the drag.

(4) **Without limber:** *Modifications:* Nos. 1 and 2 man the guide ropes at the trail of the piece; 5, 6, 7, 8 man the rear toggles at the drag, in order from right to left.

The Formation in Battery

12–18. This formation is described later under "To Prepare for Action" (arts. 12–28 and 12–29).

To Form the Platoon

12–19. The command is given **Fall in at the drag** (or **Fall in platoon to the front**).

(1) If formed *at the drag*, the men take stations, sling arms, and pick up the drag without command. The muster is made by the senior 1 p. o., or by squads, as directed. The pt. c. receives the report from the senior 1 p. o. and takes command.

(2) If formed *to the front*, the procedure is the same as for an infantry platoon.

To Sling Arms

12–20. The rifle being in any position, 1. **Sling**, 2. **ARMS.** (1) At the second command, prepare the strap; raise the piece with the right hand, insert the thumb of the left hand through the strap, and shift the right hand to the small of the stock; then, raising the rifle, insert the head and right arm through the strap, and allow the piece to hang diagonally across the back, muzzle up and to the left strap over the left shoulder.

(2) When slung in this manner, men on the left of the dragrope steady the piece with the left hand, by means of the strap; men on the right of the dragrope, with the right hand, at the butt.

(3) When packs are worn, the rifle may be slung vertically, the strap resting on the shoulder away from the dragrope.

FIG. 169

To Unsling Arms

12–21. Arms being Slung: 1. **Order (right shoulder, etc.)** 2. **ARMS.** At the second command, unsling arms and take the position directed.

To Form Platoon to the Front

12–22. The drag being manned: 1. **Platoon to the front,** 2. **MARCH.** (1) At the first command, men drop toggles and unsling arms; even-numbered dragmen stand fast, odd-numbered dragmen step into place ahead of their toggle mates, forming a normal infantry platoon faced by the flank; the gun squad closes and takes proper position in rear of drag squads; the 1 p. os. take post as leading and rear guides.

(2) At the second command, the platoon executes **column right**, the guide taking the half step. When the rear guide has completed the turn the pt. c. commands: 1. **Platoon**, 2. **HALT**, 3. **Left**, 4. **FACE.**

(3) The pt. c. dresses the platoon to the right, if in a single company; to the center, or toward the colors, if in battalion; and then takes his post 3 paces in front of the center of the platoon.

To Man the Drag

12–23. The platoon being **to the front**: 1. **Man the drag**, 2. **MARCH**

(1) At the first command, the platoon faces to the left and slings arms.

(2) At the second command, the platoon changes direction to the left along the drag, and odd numbers oblique to the left into position. The dragmen halt at their stations, face to the front and pick up the toggles. The p. os. and men of the gun squad take their posts.

When the drag is manned the platoon executes the **halt, rests, steps,** and **marchings, resumes attention, changes direction slightly, obliques,** and **resumes the direct march,** as prescribed for infantry, with the modifications noted below:

(3) In executing **halt**, Nos. 1, 2, 3, 4 check the motion of the piece and limber; the drag leaders stretch taut the drags.

(4) **In incline to the right (left)**, the drag leaders take the new direction followed by the other numbers.

(5) In **right (left) oblique**, the movement is executed in the same manner as the incline, except that the change is 45°.

To Change Direction

12–24. The drag being manned, marching or at a halt: 1. **Right (left turn)** (or **half turn**), 2. **MARCH.**

(1) **With limber.**—At the second command, the leaders turn to the right in **double time**, gaining ground so that the piece turns in a circle of 3 yards radius; the other men so regulate their step as to complete the movement **at the same time as the leaders.**

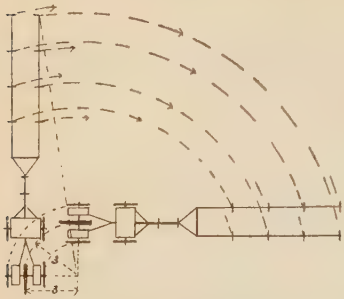

FIG. 170.—Right turn

(2) Upon the completion of the turn, the men take up the march in the same cadence as before the turn.

(3) **Without the limber:** *Modifications:* The leaders turn to the right in double time **leaving the drags slack;** other numbers so regulate their step as to **complete the movement with the leaders;** 1 and 2 raise the trail until the trail wheel is well clear of the ground, and turn the piece, assisted by 3 and 4 at the check ropes.

(4) In any case, the dragmen and gun squad must be careful not to attempt to turn the piece too soon, or by pushing on the dragrope, force the drag leaders to take a faster gait than **double time.**

To March to the Rear

12–25. The drag being manned: 1. **Right (left) about,** 2. **MARCH.** Executed as prescribed for **Right (left) turn,** except that the change of direction is 180° instead of 90°.

To Move the Piece a Short Distance by Hand

12–26. The drag being manned: 1. **Rear by hand,** 2. **MARCH.**

At the second command, all the men face to the rear, those at the piece and limber moving them backward until the command, **halt,** is given, when all face to the front. If necessary, men from drags may be detailed to assist on wheel drags of piece and limber.

12–27. Being in battery: 1. **Front (rear) by hand,** 2. **MARCH.**

At the second command, the gun squad moves the piece and then the limber as directed; after which 5, 6, 7, 8 move the ammunition boxes.

To Prepare for Action

12–28. The drag being manned, the piece is swung with the muzzle pointed in the desired direction, if not already there.

The pt. c. then commands: 1. **In battery,** 2. **MARCH.**

(1) **With limber:** At the first command, 1 and 2 unhook trail of piece from limber, 3 and 4 assisting; 5 and 6 unhook dragropes from limber; all dragmen drop the drag; the rear squad of dragmen drop back and prepare to shift the limber; 5, 6, 7, 8 drop back to the piece; dragmen, except the rear squad, unsling arms, odd numbers step into place as at **platoon to the front,** forming column of twos; the junior 1 p. o. becomes support leader and takes post abreast the drag leaders; the senior 1 p. o. becomes gun captain and prepares to supervise placing the limber and getting ready for action.

(2) At the second command or as soon as practicable, if the command **march** has already been given, the rear squad of dragmen swing the limber into position, 1 foot to the left of the piece, with the axle 1 foot to the rear of the axle of the piece, pole pointing to the front; then take post in rear of the other squads of dragmen. The support leader conducts the supports to the rear (for drill, 30 paces in rear of the piece), changes direction to the left, halts the support, faces them to the front, and deploys them on the right squad; 5 and 6, take off left ammunition boxes from the piece; 7 and 8, the right ammunition boxes, and place them on the ground in one row in rear of, and close to, the limber; all the members of the gun squad then perform the detailed duties given below and complete preparation for action; the gun captain takes station 2 paces in rear of the limber.

(3) When no ammunition is carried on the piece (as in Mark VII and Mark XI guns), 5 and 6 stay with the limber, but are assisted by the rear drag squad; 7 and 8 assist in placing trail and bedding spades.

(4) **Without limber:** *Modification:* At the first command the dragropes are dropped in place, the span is unhooked by Nos. 7 and 8, and span and crossbar placed clear of the trail. At the second command, 5, 6, 7, and 8 remove boxes from the piece and place them to the left of the piece; 1 and 2 unship trail wheel. All squads of dragmen are conducted to the rear at once. Other stations and movements are the same as with the limber.

(5) If the rifles of the gun squad interfere with their duties, they may be laid or stacked clear of the piece before or after casting the piece loose.

(6) If desired, 7 and 8 may be directed to coil down the dragropes.

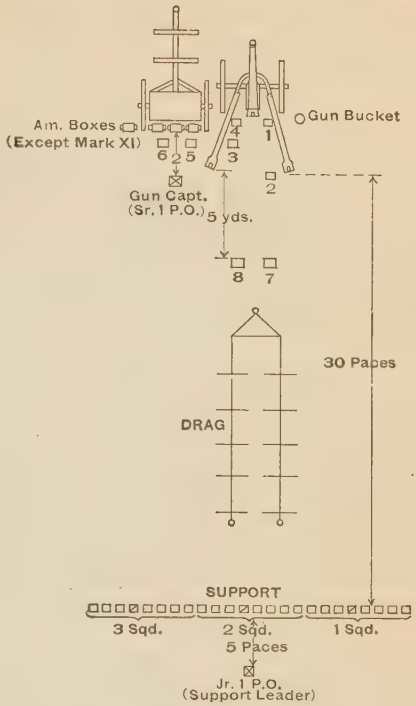

FIG. 171.—In battery

To Prepare the Piece—Detailed Duties

12–29. The detailed duties vary somewhat according to type of gun. For Mark I, mod. 1, Mark IV, and Mark XI guns, the pointer does the firing; for Mark VII gun the plugman does the firing, at the command of the pointer; Mark I, mod. 1, has a brake for each wheel; the other types have no brakes, though brakes are being fitted to Mark VII. Marks VII and XI have gun shields, seats for pointer and plugman, and panoramic sights; the other types have no shields, no seats, and open or peep sights; the location of the hand wheels for elevating, training, etc., varies; and there are other differences. (See also "Detailed duties in the Service of the Piece," article 12–69 *et seq.*)

Gun captain. Supervises preparations; reports when gun is ready.

No. 4 (pointer). Releases the training and elevating locks, if fitted, and tests training and elevating gear; provides and places the sights of whatever type supplied, so far as these are not habitually carried on the gun (the panoramic sight is always carried in its case); centers cross level bubble of sight, if fitted, to correct for difference in level of wheels; sets deflection on peep and panoramic sights at zero; raises top shield with the assistance of No. 1; provides lanyard if he is to fire; seats himself on gun seat, if any.

No. 1 (plugman). Assists pointer to raise top shield, if fitted; provides and places the gun quadrant, if supplied, sets sight at 300, and centers both range (rocker) and cross level bubbles, if on his side, tests elevating gear if on right side of gun; provides wiping cloth; operates the breech mechanism, examines breech block and bore, cleaning any parts requiring it, and leaving breech open; provides a lanyard, if he is to fire; seats himself on gun seat, if any.

No. 2 (trainer). Establishes the trail; if split trail type, uncouples trail flasks and separates as far as they will go, assisted by 7 and 8; removes breech cover; ships trail handspike, if fitted, assists No. 3 to lower the piece apron, if any; sets right wheel brake, if any; distributes waste or cotton to the gun squad for their ears; takes station by the trail.

No. 3 (loader). Removes the muzzle cover and tompion; assists No. 2 to lower the piece apron; assists No. 4 (if necessary) by placing the front sight; takes gun bucket and places it on the ground, 2 paces to right of the breech of the gun (the bore sponge is left in place until required); sets the left wheel brake; takes station on left of breech and stands by to receive a round from No. 6.

No. 5 (shellman). Equips himself with hand fuse setter, if provided (otherwise with fuse punch, or wrench, and *range-time of flight* table); takes station in rear of limber, and stands by to set fuses.

No. 6 (shellman). Opens ammunition box, takes out a round preparatory to having the fuse set.

Nos. 7 and 8 (shellman and supernumeraries). Assist in placing and opening ammunition boxes, assist No. 2 to separate trail flasks (Mark XI) and bed spades; then take station 5 yards in rear of piece to act as supernumeraries.

All members of gun squad take cover, so far as is practicable, behind piece and limber.

To Man the Drag

12–30. Being in battery: 1. **Man the drag,** 2. **MARCH.**

(1) **With limber.** At the first command the support is assembled and arms slung. 1, 2, 3, and 4 prepare the piece and accessories for the march and for limbering up; 5, 6, 7, and 8 replace ammunition boxes on the piece and limber, and prepare the limber for march.

(2) At the second command, the supports are conducted to the drag, in double time; the rear drag squad assists 5, 6, 7, and 8 to place the limber in position and leads out the drag (if necessary); 1 and 2 hook the trail to the limber; 5 and 6 hook the dragropes; the dragmen pick up and stretch taut the drags.

(3) **Without limber:** *Modifications:* 7 and 8 lead out the dragropes; 5 and 6 hook dragropes to the trail; 1 and 2 raise trail and secure trail wheel in place.

(4) In securing the piece, each member of the gun squad returns what he provided, and secures what he cast loose, with the following modifications:

No. 4 sets the panoramic sight deflection at zero before returning it to its case; lays the piece in mid-position and levels it; then secures gun with traveling lock, if provided.

No. 1 closes the breech and releases the firing pin, if cocked (Mark I, mod. 1, and Mark XI are repeating percussion type).

Nos. 5 and 6 set fuse of any round, whose fuse has been set, back at safety before returning to box.

Nos. 7 and 8 assist in returning unused rounds of ammunition and in securing boxes; also in coupling trail flasks (Mark XI).

To Prepare the Platoon for Action to the Front, Right, or Left

12–31. (1) If the character of the ground is such that a piece can not be swung as desired when limbered up with drag manned, the pt. c. may prepare for action by giving the following commands:

1. **In battery, action front (right or left),** 2. **MARCH.**

(2) At the first command, the procedure is the same as for going in **battery** in the regular manner.

(3) At the second command, 1, 2, 3, and 4 swing the piece to point in the indicated direction; the rear squad of dragmen move the limber to its position on the left of the piece; 7 and 8 shift the dragropes. Other details are the same as for going in battery in the normal manner.

(4) The direction **front, right,** and **left** here refer to the direction in which the platoon is moving at the time the order is given, not to the direction when unlimbered.

To Fire to the Right (Left or Rear)

12–32. Being in battery: 1. **Action right (left or rear).** 2. **MARCH.**

(1) **With limber.**—At the first command, 1, 2, 3, and 4 prepare to turn the piece in the new direction; 5, 6, 7, and 8 move the loose ammunition boxes clear of the intended movement and prepare to move the limber to the front or rear according as the trail of the piece is to move toward or away from the limber.

(2) At the second command, the limber is moved clear of all interference with movements of the piece and the piece is turned in the designated direction by the crew; 5, 6, 7, and 8 then reestablish the position of the limber and ammunition boxes. The entire squad should conduct the movements of limber and piece, if necessary. The support is conducted to newly assigned positions by the support leader.

The Firings

12–33. The firings and the detailed duties in the service of the piece are given under "Control of fire," articles 12–70 to 12–78, and 12–95 et seq.

Descent of Inclines

12–34. An incline too steep for the pieces to be handled in the normal manner is descended as follow:

(1) **Moderate inclines:** The platoon is halted. The pt. c. commands: **1. Reverse the drags, 2. WALK BACK.**

At the first command 5 and 6 unhook the span from the limber; the leaders followed by the other numbers on the drags, double back to the right; 4 hooks the span to the drag-hook or eye on axle of piece; and 3 and 4 shift rear-drags to the wheel-lugs of piece. At the second command, 5, 6, 7, and 8 guide the limber; 1, 2, 3, and 4 assist on wheel-drags; men on the drags take the weight of piece and limber.

(2) **With a less incline,** it may only be necessary for 3 and 4 to put on brakes without reversing drags. **With a greater incline,** the drags may be reversed as in (1), and the brakes may also be used.

(3) **A very steep incline.** Unlimber; reverse the drags on the limber, then the piece, sending each down separately. Where the declivity is rough and the trail apt to catch, hook the drags to the trail of piece and walk back.

(4) **If the declivity is especially difficult,** unlimber, hook the left drag to the right, and the right drag to the tongue of limber; then to the trail of piece, sending limber and piece down separately; all numbers manning the long single drag and walking back. In all doubtful cases, remove the ammunition boxes and pass them down separately.

To Dismiss the Platoon

12–35. The gun and limber being housed, parked, or secured the platoon is formed **to the front;** the pt. c. inspects the piece, limber, and platoon, and then directs the senior 1 p. o. to dismiss the platoon; or, the platoon may be dismissed from the position of **in battery;** such parts as directed, being secured.

Section III.—SCHOOL OF THE COMPANY

General rules

12–36. (1) The company consists of two, three, or four platoons organized as prescribed in the School of the Platoon.

(2) In column the distance between platoons is 4 paces; in line the interval between platoons is equal to the length of the dragropes, pieces, and limber (platoon length) plus 4 paces.

(3) The c. p. o. and musicians (messengers) are armed with the pistol; other enlisted men are normally armed with the rifle, except for permanently organized companies, where duty away from the piece is improbable; in the latter case the gun squad may be armed with the pistol.

(4) The signals with the sword, arm, or whistle, as prescribed for infantry, may be used for artillery as far as practicable.

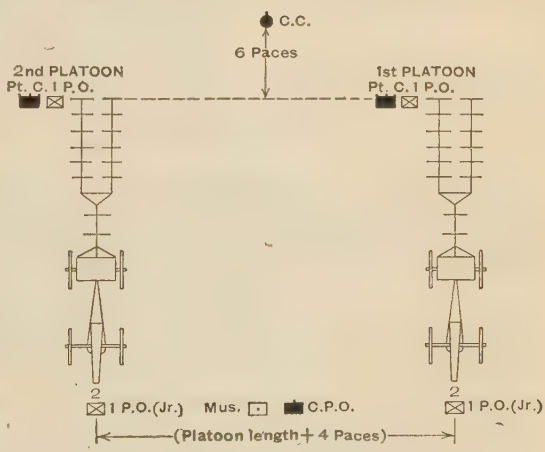

FIG. 172.—Formation in line

12–37. The company has the same formations as the platoon, namely: **platoons to the front, at the drag, and in battery;** when in formation **platoons to the front,** the platoons may be separate, or may be combined into a normal infantry company; when **at the drag,** the platoons may be in line or column

The Formation in Line

12–38. The c. c. is 6 paces in front of the center of the company. The pt. cs. are on the left of the platoon guides. The c. p. o. (if not leader of a platoon) is opposite the center of the company in line with the rear guides. The fire control detail (when separately organized) is on the left of the c. p. o.

The Formation in Column

12–39. The c. c. is 6 paces from the column, on the flank. The c. p. o. (if not a platoon leader) is opposite the center of the column and 1 pace from it, on the side away from the c. c. The fire control detail (when separately organized) is in rear of the c. p. o.

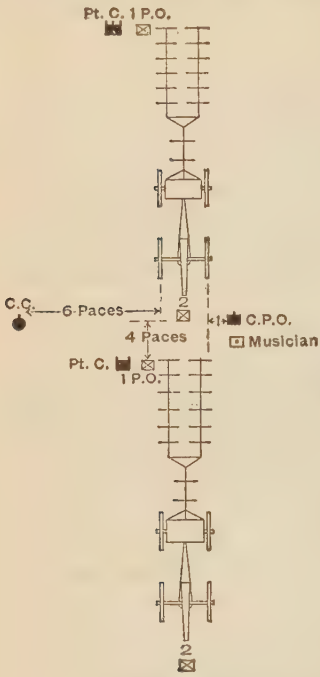

FIG. 173.—Formation in column

To Form the Company

12–40. The company is formed at the command: **Fall in at the drag (platoons to the front, or company to the front).** If formed other than as a company to the front, each pt. c. forms and takes command of his platoon, and at the command **report** by the c. c. reports **first (or other) platoon, formed, Sir.**

The Marchings, Rests, etc.

12–41. Being in line or column, the company executes the **halt, rest, steps,** and **marchings, resumes attention,** etc., as explained in the School of the Platoon.

Simultaneous Movements

12–42. (1) Simultaneous movements to the flank or rear are executed by the commands: 1. **Platoons,** 2. **Right (left) turn (right or left about, etc.),** 3. **MARCH.**

(2) **Right (left) oblique** is executed simultaneously by each platoon, in line or column.

(3) **Platoons to the front,** and **in battery,** are executed simultaneously by each platoon, from line only. **Man the drag,** is also executed simultaneously from either of the above formations.

To Form the Company to the Front

12–43. Being in the formation **platoons to the front,** the normal infantry company is formed by the commands: 1. **Form company,** 2. **On first (or other) platoon,** 3. **MARCH.** Each pt. c. causes his platoon to close on the designated platoon; pt. cs. and interior guides take post in the file closers, as in the School of the Infantry Company.

Movements from Column

12–44. Being in **column,** the company executes the following successive movements:

(1) **INCLINE TO THE RIGHT (LEFT).**

The leading platoon changes direction as indicated, followed by each following platoon when it arrives at the turning point.

(2) 1. **Column right (left),** 2. **MARCH.**

The leading platoon executes **platoon right turn,** followed by the other platoons, as they arrive at the turning point.

(3) 1. **Right (left) front into line,** 2. **MARCH,** 3. **Company,** 4. **HALT.** The leading platoon takes up, or continues the march; other platoons execute **right oblique** and resume the original direction when abreast of their places, and halt on the line.

(4) 1. **On right (left) into line,** 2. **MARCH,** 3. **Company,** 4. **HALT.** The leading platoon executes **right turn;** other platoons continue the march until abreast of their places, then execute **right turn,** and halt on the line.

Movements from Line

12–45. (1) 1. **Company**, 2. **Right (left)**, 3. **MARCH**, 4. **Company**, 5. **HALT**. The pivot platoon executes **right turn**, other platoons execute **right half turn**, twice. The command **halt** is given when the pivot platoon has advanced the desired distance. The pivot platoon halts; other platoons halt successively on the line.

(2) 1. **Right (left) by platoons**, 2. **MARCH**.

The indicated platoon moves to the front, other platoons execute **right oblique**, and each when in place in column executes **forward march**.

To Extend or Close Distance or Interval

12–46. Being in any formation. 1. **Extend (close)**, 2. **On first (or other) Platoon**, 3. **To (so many) paces**, 4. **MARCH**. Executed by appropriate commands of the pt. cs., the base platoon halting.

To Prepare for Action in any Direction

12–47. **If in line with the muzzles pointed toward the target**, the command is given 1. **In battery**, 2. **MARCH**, and is executed by each platoon separately. As this command calls for a simultaneous movement, it is not given in the middle of an evolution.

12–48. (1) **In any other formation**, the company is first maneuvered, in the most convenient manner, so that the line of pieces is at right angles to the bearing of the target. At any time after the first platoon is established the command is given 1. **Action front (right, left, or rear)**, 2. **MARCH**.

(2) The first command designates the direction of the target with reference to the front of the platoons when they are established in the new line (or column).

(3) At the second command each pt. c. swings his platoon until the muzzle of the piece is pointed in the designated direction and then goes **in battery**. In successive formations, platoons which have not reached their positions complete the evolution before going in battery. In difficult ground, or where otherwise desirable, the pt. c. may go **in battery, action front (right or left)**, without first swinging his platoon.

(4) For example, being in column, with the target directly ahead, the commands may be given 1. **Right front into line**, 2. **MARCH**, 3. **Company**, 4. **HALT**, 5. **Action front**, 6. **MARCH**. The third and fourth commands may be given as soon after the second as desirable; the fifth and sixth, immediately after the fourth.

To Change the Direction of Fire

12–49. (1) Being **in battery**: to change the direction of the fire radically to the right (left): 1. **Action right (left)**, 2. **Change front forward (by the rear) on the right (left or other) piece**, 3. **MARCH**.

(2) At the third command the piece designated as base piece is turned sharply in the direction indicated, executing **action right** as explained in the School of the Platoon. Other pieces are conducted in the most convenient manner (manning the drag, if the distance be long or the ground difficult) to the appropriate positions on the new line.

(3) If the piece on the flank toward which the turn is to be made is designated as base piece, it can open fire immediately after turning; if on the other flank, its fire will be blanketed for a time by the other pieces.

(4) If the command be **action right**, changing front forward on the right piece, or by the rear on the left piece, preserves the order; by the rear on the right piece or forward on the left piece inverts the order. For **action left**, the opposite holds true.

The Firings

12–50. Fire is conducted as described under "Control of Fire," Article 12–95 et seq.

To Dismiss the Company

12–51. The c. c. commands: **Dismiss your platoons.** Each pt. c. then dismisses his platoon as prescribed in the School of the Platoon.

Section IV.—SCHOOL OF THE BATTALION

12–52. (1) The battalion is composed of two or more companies organized as prescribed in the School of the Company.

(2) When formed in column of platoons, the distance between companies is 8 paces.

When formed in line, the interval between companies is equal to platoon length plus 8 paces.

When in column of companies (or other compound formation), the distance (or interval) between guide platoons is the same as between these platoons when in the corresponding simple formation of column (or line).

(3) In rendering honors when maneuvered with infantry, the drag leaders may be in line with the front rank of the infantry, or with platoons or companies **to the front**, in which formation the c. cs. are in line with the company officers. The artillery is at the left of the infantry in line or at the rear in column.

(4) The post of the bn. c. is 20 paces in front of the center of the line, or on the flank of the column.

(5) The staff and staff p. os. are the same as for a battalion of infantry, and their posts are the same.

(6) Men at the drag do not execute the manual in ceremonies. In presenting the battalion men armed with the pistol, when not at the drag, execute the hand salute at the command **present arms (or swords)**.

Formations

12–53. The battalion may be in the formations platoons or companies **to the front**, **at the drag**, or **in battery**. When at the drag they may be in line or column; or the compound formations, **column of companies**, or **line of companies in column of platoons**.

To Form the Battalion

12–54. The battalion is formed in the same manner as the battalion of infantry, either in line or column.

The Marchings, Rests, etc.

12–55. The battlation executes the **halt**, **rests**, **steps**, and **marchings**, **resumes attention**, **preserves alignments**, **obliques**, **resumes the direct march**, **changes direction**, goes **in battery**, **mans the drag**, goes **platoons to the front**, **extends** and **closes intervals** and **distances**, as prescribed in the School of the Company.

Simultaneous Movements

12–56. The battalion executes simultaneous movements as prescribed in the School of the Company, prefixing, when necessary the command **platoons**, or **companies** to the command as appropriate.

Successive Movements

12–57. Being in **column of platoons**, the battalion executes the following successive movements:

(1) **Right (left) front into line, 2. MARCH.**

The leading company executes **column right**, then **platoons left turn**, and halts. Other companies execute **column half right twice**, then **platoons left turn** and halt on the line established.

(2) **1. On right (left) into line, 2. MARCH, 3. Battalion, 4. HALT.**

The leading company executes **platoons right turn**. Other companies continue on, and successively execute **platoons right turn**, and halt on the line.

(3) **1. Column of companies, 2. First company, platoons right (left) turn, 3. MARCH.** Each company in turn executes the movement when it arrives at the turning point.

12–58. Being in **column of companies**, the battalion executes the following successive movements:

(1) **1. Right (left) front into line, 2. MARCH.**

Executed as for infantry (Art. 12–13 (3)).

(2) 1. **On right (left) into line**, 2. **MARCH**, 3. **Battalion**, 4. **HALT.** Executed as for infantry (see Art. 12–13 (3)).

(3) 1. **Column of platoons**, 2. **First company platoons right (left) turn**, 3. **MARCH.** Executed as for infantry.

To Prepare for Action

12–59. Executed in the same manner as prescribed in the School of the Company.

The Firings

12–60. The firings are conducted as described under "Control of Fire" (Art. 12–95, et seq.). Battalion commanders exercise **fire direction**: the **conduct of fire** is left to company commanders or fire control officers, except for firing salutes.

Battalion Review

12–61. Executed as for infantry, except that the battalion is formed **platoons to the front** for the presentation and inspection, and mans the drag preparatory to passing in review.

To Dismiss the Battalion

12–62. Executed as for infantry.

Section V.—CONTROL OF FIRE

12–63. Control of fire, in its broad sense, includes the choice and assignment of targets and positions, including observing stations, called **fire direction**; the preparation of fire and detailed fire control of the company (or battery) as a unit, called **conduct of fire**; and the detailed duties of the gun squads in the service of the piece, classed as **fire discipline.**

12–64. Fire direction is the function of battalion (or higher) commanders; conduct of fire is the function of company commanders (or fire control officers of batteries larger than a company); fire discipline is under the supervision of the senior pt. c. of each company.

12–65. Fire is said to be **direct**, when the target itself is in sight from the guns, and serves as point of aim; **indirect**, when some other object is chosen as point of aim, the target itself being usually not visible from the guns.

Guns fitted with panoramic sights may be used for either direct or indirect fire; guns not fitted with panoramic sights are best suited for direct fire, though indirect fire may be improvised, in a manner to be explained hereafter. The fire-control methods described apply directly to guns fitted with panoramic sights, but the principles are true for any type of sight, and may be applied to any gun, so far as the limitations of equipment permit.

Duties and Officers

12–66. The general duties of officers are given in articles 12–8 to 12–10, and will be discussed in greater detail hereafter.

Fire-Control Detail

12–67. The fire-control detail assists the c. c. in controlling the fire of his guns. The size of this detail depends on the equipment supplied. If the outfit includes no instruments, ordinarily the c. p. o. and one or two scouts are sufficient, unless indirect laying is to be used. If full equipment of instruments and telephones is supplied, the detail may be as follows:

(1) One **instrument p. o.**, to set up the battery commander's telescope, and to assist in calculating, recording, and transmitting firing data, and to take general charge of the fire-control detail.

(2) One **instrument assistant**, to operate the range finder or other instrument, and to assist as above.

(3) One **telephone p. o.** and **two operators**, to lay out the telephone ne from the observing station to the guns. The telephone p. o. sees that the line is in working order, reports to the c. c. when communication is established, and thereafter takes especial care that the line is not cut or communication interrupted. The operators take station at each end of the line.

The **company musicians** act as signalmen and messengers (or agents).

(4) Two **scouts**, to assist in establishing communication, act as route markers, and to observe the target and the terrain in the sector assigned to the company, reporting all changes, also to keep an eye on the flanks. If not required elsewhere, one scout may be assigned to record data for the senior pt. c.

12–68. At **in battery**, the fire-control detail provides and sets up the fire-control instruments at the location chosen for the observing station, and establishes communication with the battery. For drill purposes, unless otherwise directed, the station may be taken at 10 paces in rear of the trails, abreast the center of the battery.

Detail Duties in the Service of the Piece

12–69. The duties differ according to the type of gun (see art. 12–12). They are indicated in a general way only. For further details of the guns, etc., and especially the panoramic sight and range quadrant, see Ordnance pamphlet "Handbook of 3-inch Field and Landing Guns, etc."

12–70. The guns being **in battery** and prepared for action, as prescribed in articles 12–28 and 12–29, the detailed duties in the service of the piece are as follows:

Gun captain.

(1) Supervises and is responsible for all the details of correct service by the gun squad.

(2) Makes sure of the identification of his part of the target or of the aiming points.

(3) Keeps informed of the firing data so as to be able to repeat any parts not understood by the gun squad, but does not repeat anything unless it is called for by a subordinate. If he does not understand any part of the order, he asks for it thus: Site corrector, etc.

(4) Sees that the members of the gun squad **stand clear of the gun for the first two or more shots**, as necessary.

(5) Extends his right arm vertically as soon as the pointer calls "ready," so as to indicate that the piece is ready to fire. Lowers his hand as the pointer fires (or calls "fire").

12–71. No. 4 (pointer).

(1) To set the deflection.

(2) To apply the deflection difference.

(3) To level the cross-level bubble, thus correcting for any difference in level of wheels.

(4) To lay the gun for direction (using traversing handwheel, and having trail shifted, if necessary).

(5) **For direct fire**, to lay the gun for angle of site when No. 1 has reported **set** (using rocker elevating handwheel). This is done by bringing cross wires on target.

(6) Hooks lanyard or grasps firing handle.

(7) To call **ready**, when gun is laid and ready to fire.

(8) To move his head out of the way of the sight before the gun is fired.

(9) To fire at the correct time.

(10) To measure a deflection to a given aiming point, the gun being laid.

It is important that pointers **first** set the deflection ordered and then apply the deflection difference; this results in greater accuracy and rapidity than attempting to make the calculation mentally. In laying for direction, when he reaches the limit of the arc of train he calls **shift the trail, muzzle right (left)** to No. 2, and brings his piece back to the center of traverse, except that, in firing at moving targets, the gun is moved as far as it will go in a direction opposite to that of motion of the target.

Modifications, Mark I, mod. 1. Omit: 1, 2, 3, 4, 5, 6, 8, and 10.

Add:

3a. Sets the range.

5a. Looks over sights and directs No. 3 to train and elevate until gun is laid.

6a. Passes lanyard to No. 1, who hooks it.

Modifications, Mark IV. Omit: 2, 5, and 10.

Add:

3a. Sets the range.

5a. Lays the piece for elevation.

Modifications, Mark VII. Omit: 5, 6, and 9.

Add:

3a. **For direct fire**, sets the range.

5a. **For direct fire**, lays the gun for elevation.

9a. Calls **fire** at the proper time.

12–72. No. 1 (plugman).

(1) To open and (if necessary) to close the breech, leaving it open except when gun is loaded.

(2) Examines plug, wipes off when necessary.

(3) **For direct fire**, sets index at 300 on site scale; for **indirect fire**, centers rocker-level bubble (using rocker elevating handwheel), then sets index at angle of site directed.

(4) Elevates gun (using gun elevating handwheel) until index points at range ordered.

(5) Calls **set** when gun is laid, so far as it is assigned to him to do it.

Modifications, Mark I, mod. 1. Omit: 3, 4, and 5.

Add:

2a. Hooks lanyard after breech is closed, unhooks it after opening breech (before, if gun is loaded).

Modifications, Mark IV. Omit: 3, 4, and 5.

Add:

2a. Assists pointer, if desired, in training piece.

Modifications, Mark VII. Omit: 3 and 4.

Add:

3a. Sets the range and site on the quadrant.

3b. Centers range and cross-level bubbles of quadrant.

4a. In **indirect laying**, gives the elevation.

6. To hook the lanyard if it is to be used.

7. To fire the piece at the command of the pointer.

12–73. No. 2 (trainer).

(1) Shifts trail, when directed by pointer (assisted by 7 and 8).

(2) Beds or raises spades (assisted by 7 and 8).

(3) Extracts empties, or catches them when ejected from gun, and throws them clear of the gun squad.

12–74. No. 3 (loader).

(1) To receive a round from No. 6.

(2) To insert the round in the breech.

(3) In **volley fire** to call out the number of the round, thus (if for three rounds): **"First round, second round, third and last round."**

Modifications, Mark I, mod. 1.

Add:

2a. To elevate and train for pointer when he is at end of lanyard.

12–75. No. 5 (shellman).

(1) To set the range and corrector on the hand fuze setter, if supplied.

(2) To set the fuze (for time fire), assisted by No. 6.

(3) If fuze punch or wrench is used, to refer to **range time of flight** table and set fuze for the range, unless otherwise ordered.

(4) **To use the hand fuze setter**, set the range and corrector scales as ordered, and clamp; strip off the fuze cover; place the fuze setter over the point of the shrapnel and turn the handle of the fuze setter in a **clockwise direction** until the rotating pin of the fuze engages in the notch of the range ring carrier; then press the fuze setter firmly on the fuze, and continue to turn until the lug in the fuze setter base engages with the stop pin in the fuze body and prevents further rotation.

12–76. No. 6 (shellman).

(1) To take a round from the box.

(2) To hold the round for No. 5 to set the fuze (time fire).

(3) To pass the round to No. 3.

12–77. Nos. 7 and 8 (shellman and supernumeraries).

(1) Assist No. 2 in shifting trail, bedding and raising spades.

(2) Start construction of artificial cover, if directed. (See art. 22–37.)

Modifications, Mark I, mod. 1, Mark IV and Mark VII. Omit: 1. Add:

1a. Assists in getting ammunition boxes ready, opening, etc., as necessary.

1b. Assists No. 2 in shifting trail, when necessary, and in bedding spade.

General Instructions

12–78. When **in battery**, the breech of the gun is left open except when the gun is loaded.

The gun is loaded at the command giving the method of fire, i. e., **first piece only; battery in succession from the right**, etc., or as soon thereafter as the fuse can be accurately set.

The command for firing, by the c. c. or senior pt. c. is usually accompanied by bringing the right arm from a vertical position quickly down to the side. In **salvo fire**, the pointer waits until it is his turn to fire.

All the gun squad **stand clear of the piece for the first round**, which is always fired with the lanyard, and for succeeding rounds, until the spade is well bedded.

In hard ground the recoil is apt to be excessive, especially for the Mark IV and Mark VII guns, which have no brakes. A trench should be dug for the spade, if necessary. In firing with the gun depressed, the piece is liable to jump clear of the ground, especially the Mark IV.

B. Artillery in the Field

Section I.—DEFINITIONS

12–79. Angle of elevation: The angle between the plane of site and the axis of the bore.

Angle of fall: The angle between the plane of site and the tangent to the trajectory at the point of fall.

FIG. 174a

Angle of incidence: The angle between the plane of the surface struck and the tangent to the trajectory at the point of impact.

Burst center, center of burst, or **mean point of burst:** The point about which the points of burst of several projectiles are evenly distributed.

Burst interval: The distance in the plane of site from the point of burst to the target.

Burst range: The distance from the muzzle of the gun to the point of burst.

Counterslope: A slope which descends toward the enemy and is wholly or partially hidden from him by the covering crest of the reverse slope.

Crest: The summit of a ridge.

Danger space: The distance, in the plane of the slope considered, over which an object of a given height would be struck.

Deflection: The angle between two vertical planes containing, one the line of sight, and the other the axis of the bore.

Direct laying: Pointing the gun for direction and elevation by directing the line of sight upon the target.

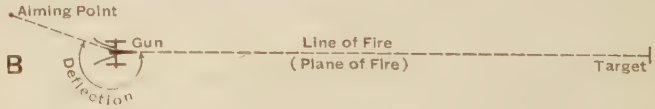

FIG. 174b

Drift: The departure of the projectile from the plane of fire due to its rotation and to the resistance of the air.

Height of burst: (1) The vertical angle between the plane of site and a right line joining the muzzle of the gun and the point of burst. (2) The ordinate of a point of burst.

Indirect laying: Pointing the gun for direction by directing the line of sight upon an objective other than the target, and for elevation by the use of a quadrant or elevation level.

Line of sight: The right line passing through the sights and the target or the aiming point.

Mil: The unit of angular measure, one sixty-four-hundredth of a circle. The arc which subtends a mil at the center of a circle, is, for practical purposes, equal to one one-thousandth of the radius. The arc and its tangent are nearly equal for angles not greater than 330 mils.

Military crest: The line nearest a crest from which all the ground toward the enemy may be seen and reached by fire.

Ordinate: The distance of a point of the trajectory from the plane of site. The **maximum ordinate** is the ordinate of the highest point of the trajectory.

Parallax: The angle at any point subtended by any given line; usually the line connecting two adjacent guns of the same battery.

Plane of fire: The vertical plane through the line of departure; also called **plane of departure.**

Plane of site: A plane containing the right line from the muzzle of the gun to the target, and a horizontal line perpendicular to the axis of the bore at the muzzle.

Point of fall, of impact, or of graze: The point where the projectile strikes.

Quadrant elevation: The angle between a horizontal plane and the axis of the bore when the gun is laid.

Range: The distance from the muzzle of the gun to the target.

Reverse slope: The slope which, from the direction of the enemy, is hidden by a ridge of which the slope is a part.

Site: The angle between a horizontal plane and a right line joining the muzzle of the gun and the target; called also the **angle of position.** The origin of sight scales is taken at 300.

Time of flight: The time in seconds required for the projectile to travel from the muzzle of the gun to any point of the trajectory—usually to the point of fall or of burst.

Trajectory: The path described by the projectile in its flight.

Positions

12–80. Artillery may be posted for **immediate action, in observation,** or **in readiness.**

When posted for **immediate action** the guns are unlimbered and fire is opened as promptly as possible upon the indicated targets.

When posted **in observation** the guns are unlimbered and all preparations made for opening fire at the desired moment upon the existing or expected targets.

When posted **in readiness** the guns are not unlimbered. They are held under cover near a position for possible immediate action, but so that they can be moved quickly to another locality if the situation requires. In the meantime the immediate tactical situation is studied.

12–81. Positions are defined as **masked** or **in the open,** according as they afford concealment from the hostile position or not.

(*a*) If the guns are posted so that through the sights the hostile position can be seen over the mask, they are said to be **in the open.**

(*b*) If where a dismounted man can just see the hostile position over the mask, they are said to have **dismounted defilade.**

(*c*) If so that the flash of the gun will be concealed from the hostile position, to have **flash defilade.**

12–82. Defilade may be taken against the target to be attacked; but preferably, against the highest position from which enemy parties can effectually observe.

12–83. A defilade of 12 feet is sufficient to conceal the flash of the gun by day. A defilade greater than this is still referred to, however, **as flash defilade.**

Observing Stations

12–84. The officer conducting the fire should choose his observing station so that he can see all of his sector and as much as possible of the adjoining terrain.

To facilitate the transmission of orders and the proper exercise of command the station should be as near the guns as the conditions permit. This may often be accomplished by using elevated observing stations, such as trees, buildings, etc., or a specially prepared ladder or tower. He preferably takes a position on the windward flank in order that his view may not be cut off by dust and smoke and that his voice may carry more certainly.

12–85. But the proximity of other batteries, the advantage of flash defilade, and of withdrawing the guns from their mask to reduce the chance of their being reached by searching fire, and the compelling necessity of observations may impose a station remote from the guns. In such a case reliable communication must be established and maintained.

12–86. If the station is in immediate proximity to the guns or is apt to be subjected to the enemy's searching fire, suitable protection from hostile fire should, whenever possible, be provided for the observing officer.

Designation of Objectives

12–87. Objectives must be designated in a prompt, concise, and unmistakable manner.

12–88. If targets are distinct and clearly defined, they may be designated by name. If a target is indistinct, poorly defined, or masked, then an area may be designated for attack, the nature of the target being invariably given.

12–89. In designating objectives the following procedure is appropriate, especially when the objective is not conspicuous or readily recognized:

Define the **relative position** of the objective by giving the approximate direction and distance of the objective and its location with respect to a prominent feature of the landscape as a **reference point.** Then give its important **characteristics,** such as its nature, shape, and color. Sometimes the **site** of an objective will simplify its designation.

12–90. Directions may be indicated by pointing; by the use of military terms such as **to our left front;** by the use of imaginary hour marks on an artificial horizontal clockface the center of which is at the position of the speaker, and the 12 o'clock mark directly to the front of the position or at a reference point; by the similar use of a vertical clockface whose center is assumed to be at a reference point; by the points of the compass.

12–91. The location of an objective may sometimes be fixed by coordinates.

12–92. If the objective is in itself inconspicuous, it is usually best to designate first the most prominent object in its general direction, then to give the angular distance between this reference point and the real objective and then to give the distance to and description of the latter.

Thus:

1. At 2 o'clock horizontal.
2. At 3,000 yards a large stone house, square, two storied, with a cupola on top
3. Five hundred mils to the right of the cupola.
4. At 2,500 yards a light battery in position in rear of the large orchard.

Or:

1. Northwest.
2. At 5,000 yards two symmetrical hills of the same height.
3. The left peak the reference point.
4. At 7 o'clock vertically, a field of brown weeds.
5. In that field, a machine-gun battery.

Or:

1. The lone tree on Artillery Ridge.
2. Two hundred yards south and four hundred yards west, a bare stretch of road.
3. Beyond the road, machine guns.

12–93. If it is necessary to designate objectives to a person at a distance, it is important to remember that objects often present very different appearances if viewed from widely separated positions. This also applies to panoramic sketches. If a courier is used to transmit such information, he is required to keep the objective in view as much as possible while passing from one station to the other.

12–94. The designation of objectives may be greatly facilitated by the use of maps or by causing a position or place sketch of the terrain to be prepared and copies to be furnished the different subordinate commanders concerned. On such a sketch important landmarks and military objectives should be named or numbered for ready reference, or the map may be ruled into squares each being appropriately designated.

Section II.—PREPARATION OF FIRE

12–95. The fire control officer is normally the company commander; or the senior company commander where the guns of more than one artillery company are grouped for purposes of fire control, and as such may also be designated as battery commander. He is charged with the preparation of firing data, called the **preparation of fire.**

12–96. The **firing data** embrace all the information and commands necessary to enable the gun squads to accomplish the orderly, rapid, and accurate service of the pieces.

12–97. The complete firing data are always necessary before firing the first salvo or volley after occupying a position. After the first salvo or volley the fire control officer announces only so much of the data as he desires to change.

12–98. The necessary data for **indirect laying** in their habitual sequence are:

1. The designation of the aiming point.
2. The deflection.
3. The deflection difference.
4. The site.
5. The kind of projectile (corrector or percussion shrapnel).
6. The range.
7. The method of fire.
8. The command, **fire.**

12–99. The necessary data for **direct laying** in their habitual sequence are:

1. The designation of the target.
2. The deflection.
3. The kind of projectile (corrector or percussion).
4. The range.
5. The method of fire.
6. The command, **fire.**

Section III.—THE DETERMINATION OF FIRING DATA

The Target or Aiming Point

12–100. Where direct fire is to be employed, the target will usually be in such plain sight from the guns that its designation involves no difficulty. The command for **direct fire** is **TARGET—THAT BLOCK HOUSE** (or as the case may be).

Where **indirect fire** is to be used, the command is **AIMING POINT—THAT WINDMILL** (or as the case may be).

12–101. The selection of aiming points calls for special attention. The best aiming points are:

1. Continuously visible through the panoramic sight of each gun.
2. Easily designated and identified.
3. Of narrow width and sharp definition.
4. At a considerable distance from the guns.
5. Near the normal to the line of guns, or near the line of the guns prolonged.

It will frequently be impractical to select an aiming point fulfilling all these conditions.

12–102. The use of the same aiming point by all of the guns of a fire unit simplifies conduct of fire.

Some object which quickly attracts the eye should be selected, and, if possible, it should be the only object of its kind in the vicinity so that mistakes may not arise either in the designation of the aiming point or in finding it quickly after looking away.

Narrowness and sharp definition in an aiming point make uniformity of laying more certain. If a broad aiming point must be chosen, the part of it to be used must be designated. If a tree, its trunk may be designated; if a ledge of rock, a certain edge; if a building, a certain chimney, peak, or gable.

12–103. Although refinements in calculation of parallax (see "Deflection difference," arts. 12–121 and 12–122) are uncalled for, aiming points should be chosen to reduce calculations. If the object is distant, the parallax corrections will be small; usually objects more than 2,000 yards distant are best. If the object is directly behind or ahead of the guns, the parallax need not be corrected for obliquity; if on the flank, the parallax is zero.

12–104. A point in rear of the guns is preferable to one in front, because the top shield does not interfere with vision.

A point on a flank is appropriate when at a greater distance than 1,000 yards and when enough to the rear to prevent its being obscured by any of the matériel or personnel. At shorter distances the recoil of the gun carriages materially changes the parallax, thus shifting the sheaf of fire and causing irregularities of distribution.

12–105. When artificial aiming points must be established near the guns, the best direction for a common one is directly in rear of the center of the line of guns. To reduce the effect of recoil upon parallax a separate one may be placed directly in rear of each gun.

12–106. If the distant aiming point is apt to be obscured by mist or smoke, then provision must be made for a secondary aiming point. The guns having

been oriented on the target by means of the distant aiming point, the sights may, when necessary, be turned upon the new aiming point and the latter used in subsequent fire.

Deflection

12–107. In **direct fire**, the only corrections are for drift of projectile, effect of wind on projectile, and motion of the target. Their amount is small.

The correction for drift is always additive; that for wind may be either additive or subtractive, depending upon the direction of the wind. The value of each correction is first estimated; they are then combined to secure the resultant correction.

The following rough rules may be of assistance:

1. To overcome drift increase the deflection by 3 mils for ranges up to 3,500 yards; by 5 mils for longer ranges.
2. To overcome a 10-mile cross wind change the deflection in the appropriate sense by an amount in mils equal to the number of even thousands of yards in the range.

12–108. The travel of a target during the flight of a projectile is corrected as follows:

If the line of travel of the target makes an angle greater than 45° with the line of fire, take 5 mils deflection if the target is moving at a walk; 10 mils, if moving at a trot; 15 mils, if moving at a gallop. If the line of travel makes an angle less than 45° and greater than 15°, take one-half of the foregoing deflections. For angles less than 15° make no correction.

If the target is moving to the left, add the correction; if to the right, subtract it.

12–109. For **indirect fire** there must be determined the deflection setting which will cause each piece to be directed upon its target when its line of sight is directed upon its aiming point. In unfavorable country this may some imes require considerable ingenuity. The method usually employed is to select a common aiming point and to determine the deflection which will cause one of the pieces (the directing piece) to be pointed in the required direction. The corrections for wind, drift, and movement of the target are then applied with the proper sign if conditions render such refinements advisable. A correction is also determined which, applied in arithmetical progression to the deflection of the directing piece, will give for each of the other pieces the deflection necessary to bring its line of fire in the appropriate direction.

The command for designating the deflection is: **DEFLECTION (SO AND SO).**

GRADUATION OF THE DEFLECTION SCALE

12–110. Both the panoramic sight, and the battery commander's telescope have the horizontal graduations in **mils.** There are 6,400 mils in a circle, and an angle of one mil has a natural tangent of $\frac{1}{1000}$ (approximately). In other words, if an object has an angular width of 1 mil, it is 1 yard wide, if 1,000 yards distant; 2 yards wide, if 2,000; 3 yards wide, if 3,000; and so on.

The battery commander's telescope is graduated in **counter-clockwise** direction, 0–6400; the panoramic sight in **clockwise** direction, 0–6400. The zero of the panoramic sight scale is pointed toward the target, its direction being parallel to the axis of the gun. The zero of the battery commander's telescope is directed at the **aiming point.**

12–111. If the battery commander's telescope is set at zero and clamped to the scale, and the scale is unclamped from the stand, the telescope and scale may be revolved, pointed at the aiming point, the scale there clamped and telescope unclamped. The telescope may now be directed at the desired target, and the deflection read, say 2,400. If now the panoramic sight be set at the same deflection, 2,400, and if gun and sight be swung until the sight is on the aiming point, the gun will be pointed on the target. (See fig. 175.) The above holds exactly where the panoramic sight and battery commander's telescope are located in the same vertical line. If, as is usually the case, the battery commander's telescope is at an observing station more or less distant from the gun, the observed deflection must be corrected for use at the gun as described below.

CORRECTION OF THE DEFLECTION

12–112. The angle between the aiming point and target, at the observing station, must be corrected by (1) the offset from the target, and (2) the offset from the aiming point. (See fig. 176.)

The offset from the aiming point is the perpendicular distance from the observing station to the **gun-aiming point** line or line prolonged, reduced to

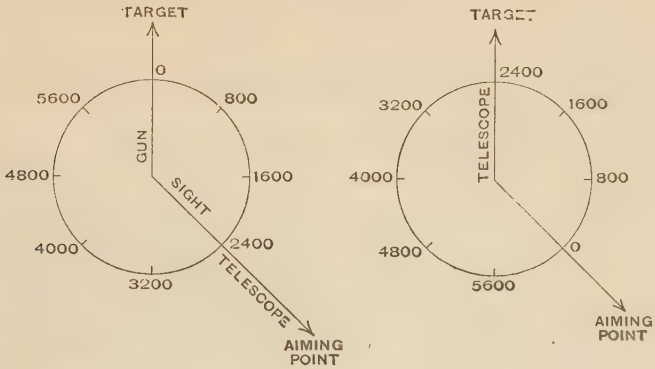

FIG. 175

mils by dividing by $\frac{1}{10000}$ of the distance to the aiming point.

The offset from the target is the perpendicular distance from the observing station to the **gun-target** line or line prolonged, reduced to **mils** by dividing by $\frac{1}{10000}$ of the distance to the target.

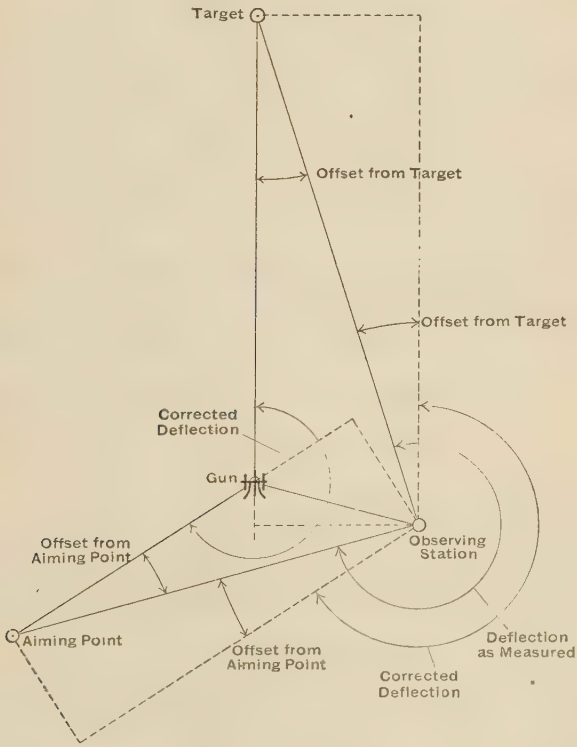

FIG. 176

These corrections are sometimes added to the measured deflection, and sometimes subtracted, depending on the relative positions of observing station and aiming point with reference to the gun and target.

12–113. The offset from the **aiming point** depends (1) on whether the observing station is on the right flank or left flank of the gun; (2) on whether the aiming point is in front, or in rear, of the line from observing station to gun.

The offset from the **target** depends only on the first of the above two conditions.

The rules follow:

I. **Aiming point to the rear.**

Observing station on **right flank, subtract** both offsets; observing station on **left flank, add** both offsets.

II. **Aiming point to the front.**

Observation station on **right flank**, add aiming point, offset, and **subtract** target offset; observing station on **left flank, subtract** aiming point offset and **add** target offset.

When the angle from aiming point to target is directly measured, the offset computed and applied as above given, it is known as the **parallax method.**

12–114. Another method, called the **parallel method**, is as follows:

Estimate or compute the two offsets, as prescribed in art. 12–112. Then (1) pick out on the terrain an object as a horizontal angle from the target (as seen from the observing station) equal to the offset from the target and on the side of the target away from the gun. The line from observing station to this point is parallel to the **gun-target** line.

(2) Pick out on the terrain an object at a horizontal angle from the aiming point (as seen from the observing station) equal to the offset from the aiming point, on the side away from the gun. The line from observing station to this object is parallel to the **gun-aiming point** line.

(3) The angle from the object near the aiming point to that near the target is then measured, and is the **corrected deflection.**

12–115. In practice, using the battery commander's telescope, it will usually be easiest to compute the **offset from the aiming point**, set the telescope at that angle, direct the telescope on the aiming point, and clamp the scale. The telescope may then be directed on the target, and the **offset from the target** applied mentally. In using this method, the aiming point offset must be applied so that, when the telescope is directed at the aiming point, the zero will be on the side away from the gun, its direction being parallel to the gun-aiming point line. For example, if the effect from the aiming point is 30 mils, and the aiming point is to the left of the gun, **as seen from observing station**, the telescope would be set at 6370. This method permits the rapid shifting from one target to another, there being only the new target offset to apply after measuring the deflection of the new target.

In **shifting targets**, this may also be done by measuring the angle from the old to the new target, marking this angle + if the new target is to the left of the old (since the pointer must increase his deflection), — if to the right. Then calculate the offsets from the old and new targets, and apply as if the old target were an aiming point, using the rule given for calculating the deflection. (Art. 12–113.)

For example, if the new target is 250 mils to the right of the old target, and if the old offset is 55, new offset 40, and if the observing station is on the right flank, we have

$$-250+55-40=-235$$

and the order is given **RIGHT 235.**

Unless time is taken to compute the deflection very accurately, it is usually given to the nearest multiple of 10.

12–116. In general, the direction of fire may be changed (1) by designating a new target (for direct fire); (2) by giving a new deflection (using same aiming point); (3) by the command **RIGHT (LEFT) (SO MUCH).**

Deflection Difference

12–117. Unless otherwise ordered, the right piece of the battery is the **directing piece.** The two or more guns of the battery, being equal distances apart, may be so pointed as to converge upon any part of the target, or be distributed over a wide front.

The lines of fire of several pieces collectively directed form the **sheaf of fire**

12–118. In **indirect fire**, with the sights all pointed at a common aiming point, it is usually necessary to give the guns different deflections in order that each gun may be brought on its own part of the target. The common difference in deflection between any two adjacent pieces is called the **deflection difference.**

By increasing or diminishing the deflection difference, the front on which the projectiles fall may be increased or decreased at will.

12–119. The value of the deflection difference necessary to make the several lines of fire intersect at the target is called the **convergence difference.**

12–120. Each gun being laid upon its own part of the target, the amount by which its deflection would have to be changed to make it converge on the target of the adjacent gun, to the right or left, is called the **distribution difference.** If the distribution difference is zero, all guns converge on the same target.

To Calculate the Deflection Difference

12–121. The value of the deflection difference depends on the distance and relative bearing, from the line of pieces, of the aiming point and target; the distance the guns are apart; and the desired distribution.

12–122. **Parallax of the aiming point** is the angle subtended, at the aiming point, by the distance between two adjacent guns of the battery. It has its maximum value when the aiming point is directly in front or rear of the line of pieces.

Parallax of the target is the angle subtended, at the target, by the distance between two adjacent guns. As the target is usually directly in front of the line of piece, its parallax is generally a maximum.

Where the aiming point or target is not directly behind or in front of the line of pieces, the distance used is not the full distance, but the distance measured in a direction perpendicular to the line of aiming point or target, respectively.

The rules follow:

I. **Parallel fire. Close** by the parallax of the aiming point, if aiming point is in **rear**, and **open** by parallax of aiming point, if aiming point is in **front.**

II. **Converging fire.** (1) **Close** by the parallax of the aiming point, if aiming point is in **rear**, and **open** by parallax of aiming point, if aiming point is in **front**;

(2) then **close** by parallax of target.

III. **Distributed fire.** (1) **Close** by the parallax of aiming point, if aiming point is in **rear**, and **open** by parallax of aiming point, if aiming point is in **front.**

(2) **close** by parallax of target;

(3) then **open** by an amount equal to the front of target to be covered, in mils, **divided by one less** than the number of guns in the battery (see also art. 12–234 "Distribution of fire for effect").

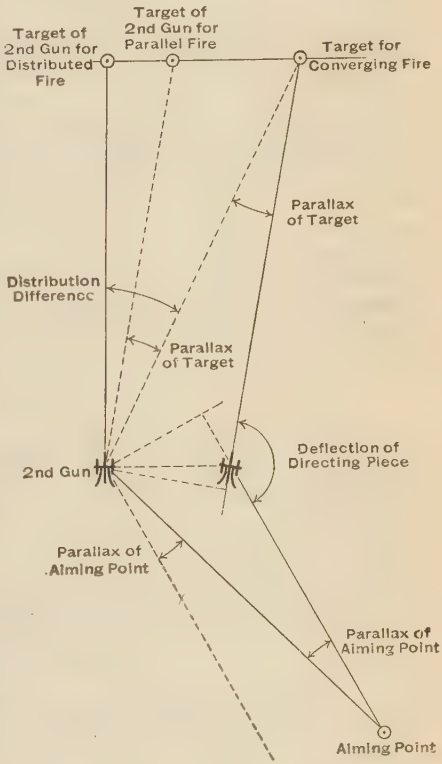

FIG. 177

These rules are based on the supposition that the guns are (1) brought **parallel**; (2) then **converged**; (3) then **distributed** over the desired front; and (4) that the **directing piece** is given the deflection necessary to enable it to **hit its proper part of the target.**

12–123. Unless time is taken to compute firing data very accurately, the deflection difference is usually given to the nearest multiple of 5.

The command is: **ON FIRST (OR OTHER) PIECE—OPEN (CLOSE) (SO MUCH).** If the command is **open**, pieces on the **left** of the directing piece increase the deflection by as many times the deflection difference as the gun is intervals away from the directing piece; if on the **right**, they similarly decrease it. If the command is **close**, the reverse applies.

For subsequent firings, to change the distribution, the order is: **ON (SUCH) PIECE, OPEN (CLOSE) (SO MUCH)**, and the deflection of each piece is changed, in the direction indicated by the designated amount (times the number of intervals it is away from the new directing piece); that is, the correction is applied directly to the deflection reading for the gun itself, not the possibly different one of the directing piece, or the direction of a single piece may be changed by the order: **SECOND (OR OTHER) PIECE, RIGHT (LEFT) (SO MUCH)**.

The Site

12–124. The **site** (angle of site or position angle) is measured in mils, in the vertical plane, the horizontal being represented by **300**. If the target is 10 mils higher than the gun, the site is 310; if 10 mils lower than the gun, 290.

If the target is visible from the position of the guns, the site may be measured there. If not visible from the guns, the site may be measured at the observing station and transformed for use at the guns.

In open country the site may often be estimated with sufficient accuracy by referring the site of the target to a distant horizon, the site of which is ordinarily 300.

12–125. If the observing station is near the guns, but at a different level, the angle measured at the observing station is corrected as follows: Estimate the difference of level in yards between observing station and guns; convert this difference into mils by dividing by $\frac{1}{1000}$ of the range to target, and apply the result with the proper sign as a correction to the site of the target as measured at the observing station.

Example:

Site measured at observing station	=	320 mils.
Estimated height of observing station above guns	=	30 yards.
Range of target (measured or estimated)	=	3,300 yards.

$$\text{Correction} = +\frac{30}{3} = +10 \text{ mils.}$$

Site at guns $= 320 + 10 = 330$ mils.

12–126. If the distance from observing station to target differs materially from that of gun to the target, proceed as follows:

(1) Measure the site of the target in mils, **multiply** the amount the site differs from 300 by $\frac{1}{1000}$ of the distance to target, in yards; the result is the height of the target above or below **observing station** in yards.

(2) Similarly estimate or compute the height of the **guns** above or below the observing station, in yards. This value added or subtracted from the preceding value, gives the height of the target above or below the guns, in yards.

(3) Convert this to mils, by **dividing** by $\frac{1}{1000}$ of the range from gun to target, in yards. If target is **higher** than the guns, **add** to 300; if **lower subtract.**

The command is given: **SITE (SO MUCH)**. It is usually given to the nearest multiple of 5.

The Kind of Projectile

12–127. Projectiles may be of the following types: (1) High-explosive shell; (2) High-explosive shrapnel; (3) Common shrapnel. Of these, only the common shrapnel is used in the United States Navy. This is fitted with several different types of fuzes, namely: Bethlehem 12-second, F. A. 15-second, and F. A. 21-second. The method of setting these fuzes differs somewhat, according to the type. All three are combination fuzes. The Frankford Arsenal (F. A) 21-second combination, having been ordered for future shrapnel, is the one principally referred to in this section. It has a hand fuze setter which simplifies the setting of the fuze. For other types certain modifications are necessary.

12–128. With reference to the setting of the fuze, fire may be **time fire,** where the projectile bursts after a given time; or **percussion fire,** where it bursts only on impact.

12–129. For convenience, the **hand fuze setter** for setting the time fuze is graduated in range. But, due to errors of the fuze and other causes, the base charge will not always explode at exactly the range set off. Moreover, it is

sometimes necessary to vary the height of burst. For this the fuze setter is arranged to permit changing the fuze setting without changing the range reading on the fuze setter. The device for accomplishing this is called **the corrector** and consists of an auxiliary scale, graduated from 0 to 60. A corrector of 30 ordinarily gives a height of burst of about 3 mils as seen from the guns. This height of burst is called **normal**. Raising the corrector **shortens** the time train and therefore **raises** the height of burst.

Each division of the corrector scale changes the height of burst about 1 mil, which brings the point of burst about 20 yards nearer or farther from the firing gun. Thus for a setting of corrector 35, at any range, the burst should appear about $5+3=8$ mils above, and about $8\times20=160$ yards short of the target. (These values are only an approximation.)

The command for time fire is: **CORRECTOR 30 (OR SO MUCH)**.

12–130. Where no hand fuze setter is supplied, it is necessary to refer to some auxiliary table (sometimes this is graduated on the sight bar) giving the time of flight corresponding to the range of target. A **range-time of flight** table (abbreviated from the range table) facilitates setting the fuze under these conditions.

12–131. For **percussion fire**, the fuze is set at "safety." This automatically sets it to burst on impact. The command is: **PERCUSSION.**

12–132. To change corrector setting the command is: **CORRECTOR UP (DOWN) (SO MUCH)**. For instance, if the corrector is already at 35 and the command is **up 3** the new setting is 38.

The Range

12–133. The initial range may be determined by means of a range-finding instrument, by angle-measuring instruments, and a measured base, by the use of maps, by sound, by estimation, from auxiliary observers, from previous fire, or from other units. It should be as accurately determined as circumstances permit, since its correct predetermination is essential to promptness of effect.

If the objective is indistinct, or if the air is calm or gently blowing from the range toward the observer, so that the smoke of bursts is likely to obscure the target for an appreciable time, the first range used should be somewhat long.

If fire over friendly troops near the target becomes necessary, the first range used should be surely long.

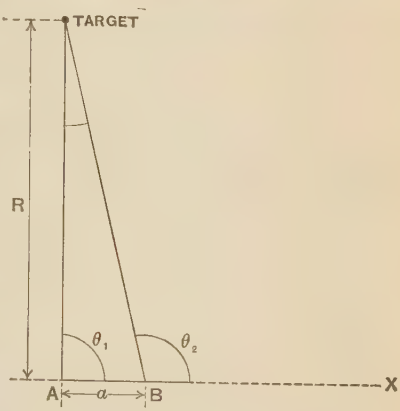

FIG. 178

12–134. To measure the range perhaps the easiest method is as follows: Select an aiming point X, whose bearing is as nearly 90° as practicable from the target. Post men, or drive stakes at A (position of observer) and B, so that A, B, and X, are in the same straight line. (Target and aiming point must be visible from A and B). Then measure AB which is the base line a. Occupy A and read the angle θ_1, then occupy B and read θ_2.

$$\text{Then the range, } R \text{ (in yards)} = \frac{a \text{ (in yards)} \times \sin \theta_2}{\sin (\theta_2 - \theta_1)}.$$

This may readily be computed if trigonometric tables or the slide rule are available; the equation holds true whether θ_1 is a right angle or not.

But if θ_1 and θ_2 are between (say) 80° and 100°, and if the angles are measured in **mils** then the following equation, readily computed without tables, may be used:

$$\text{Range (in yards)} = \frac{a \text{ (in yards)} \times 1000}{(\theta_2 - \theta_1) \text{ (in mils)}}.$$

To transmit the range the command is given: **RANGE 3250 (OR SO MUCH).**

Section IV.—THE METHOD OF FIRE

12–135. The methods of fire are (1) by single (designated) piece; (2) by salvo: (3) volley fire; (4) continuous fire; (5) fire at will.

(1) **By single piece.** The designated piece only, loads and fires. The command is: **FIRST (OR OTHER) PIECE ONLY.**

(2) **By salvo.** A battery salvo is a single round from each gun of the battery fired in succession, commencing with the designated flank. The interval between shots, unless otherwise directed, is about two seconds. The command is:

BATTERY IN SUCCESSION FROM THE RIGHT (LEFT); or to fire a salvo from two guns: **THIRD AND FOURTH (OR OTHER) PIECES IN SUCCESSION FROM THE RIGHT (LEFT).**

The flank to leeward should always be designated to fire first, as the bursts can be better observed.

(3) **Volley fire.** This consists in each piece, independently of the others, firing the designated number of rounds as rapidly as possible, **consistent with accuracy.** The command is: **BATTERY THREE (OR SO MANY) ROUNDS.**

(4) **Continuous fire.** Each piece fires continuously, at designated intervals, the interval will be short or long, as ordered.

The command is: **BATTERY CONTINUOUS FIRE RAPID (OR AT SO MANY SECONDS INTERVAL).** "Drum" fire and "barrage" fire are in this class.

(5) **Fire at will.** This is used solely for the close defense of the guns. Fire is opened when directed, refinements of laying are neglected, and the effort made to establish a fire swept zone through which the enemy must advance.

12–136. The command is **FIRE**, for a **single piece**, or a **battery salvo**; **COMMENCE FIRING** for **volley fire, continuous fire** and **fire at will**, the command is given by the fire control officer, and if he is at some distance, it is repeated by the senior pt. c., when all guns are ready. For a battery salvo the command is given only once, and refers to all guns, which then fire in succession. The pointer gives the order **FIRE** for his individual piece.

Section V.—SUMMARY

12–137. The following is a summary of the foregoing rules for indirect fire:

(1) Select an observing station from which a good view of the target and its surroundings may be obtained, as close to the guns as conditions permit, and as nearly as possible on prolongation of their front.

(2) Select an aiming point which is surely visible from all the guns, preferably directly in rear, and at least 2,000 yards away.

(3) Measure or estimate the perpendicular distance from observing station to gun-aiming point line, and calculate the aiming point offset; also the perpendicular distance to gun-target line, and calculate the offset from the target. Measure the angle from aiming point to target, apply offsets, and get the deflection of the directing piece.

(4) Measure or estimate the distance between guns, measured normal to gun-aiming point line, and calculate the parallax of aiming point; also the distance measured normal to gun-target line, and calculate the parallax of target. Measure the front of target to be covered, in mils, and calculate the distribution difference. From these, calculate the deflection difference.

(5) Measure the site of target, and correct, if necessary, for any difference of level between observing station and guns.

(6) Measure the range, using the best means available.

12–138. Example: An artillery company is ordered to take a masked position and open fire upon a body of infantry about 3,000 yards away.

The c. c. finds an observing station 200 yards to the **left** of the **right** piece, and a little in advance of the battery front. He selects an aiming point in rear, 5,000 yards away.

He estimates the perpendicular distance to gun-aiming point line to be **175** yards, and calculates offset from aiming point $\frac{175}{5}=35$ mils.

He estimates distance to gun-target line as **200** yards, and calculates offset from target $=\frac{200}{3}=67$ mils. He measures angle from aiming point to target, 2,532 mils. Then **deflection of directing piece**$=2{,}532+35+67=$**2,634.** He estimates distance between guns, measured normal to gun-aiming point line as 17 yards; normal to gun-target line as **20** yards. He has (say) four guns in

his company, and the measured front of target is 50 mils. He calculates: parallax of aiming point $=\frac{17}{5}=3$; parallax of target $=\frac{20}{3}=7$; distribution difference $=\frac{50}{4-1}=17$; and **deflection difference**, close by 3, close by 7, open by 17 = **open by 7** (algebraic sum).

He measures the site **292**, and estimates that the guns are 7 yards lower than observing station. He calculates $300-292=8$; $8\times\frac{3000}{1000}=24$; $24-7=17$ yards; $\frac{17\times1000}{3000}=6$; $300-6=294$; therefore the **site** is **294** (corrected).

He measures the range with a range finder, **3,150.**

He commands:

1. **Aiming point, that lone tree.**
2. **Deflection 2,630** (nearest multiple of 10).
3. **On first piece, open by 5** (nearest multiple of 5).
4. **Site 295** (nearest multiple of 5).
5. **Corrector 28.**
6. **Range, 3,150.**
7. **Battery, in succession from the right.**
8. **FIRE.**

The fire-control officer observes this salvo and estimates the **direction** of the third piece as correct, the **distribution** as somewhat too large, the **height of burst** as high (all four burst in air mean height 9 mils), and the **range** as indeterminate (on account of the high bursts).

He commands:

1. **On third piece close 5.**
2. **Corrector down 10.**
3. **Battery, in succession from the right.**
4. **FIRE.**

and fires such other salvos as may be necessary to effect the adjustment.

Having fired upon the target of the previous example until it disappears at 4,000 yards, the battery commander sees another body of troops whose range he estimates as 2,000 yards. Using the ruler, he finds that his target is 300 mils to the right of the last target and that its site is 295.

Treating the old target as an **aiming point** (and remembering that observing station is on left flank, 200 yards from gun-target line) he computes deflection $=-300-\frac{200}{4}+\frac{200}{2}=-250$.

He commands:

1. **Right, 250.**
2. **Site, 295.**
3. **Corrector, 20.**
4. **Range, 2,000.**
5. **Battery, in succession from the right.**
6. **FIRE.**

Guns Not Fitted With Panoramic Sights

12–139. The commands and the methods differ only where conditions make a departure from the foregoing necessary. Indirect fire, for guns not having panoramic sights, may be improvised as follows:

The directing piece is pointed in the direction of the target, by the best means available.

On the hillside in front of the gun, and, if practicable, at least 200 yards distant, a stake is driven, or a large stone or other marker placed, to serve as an aiming point; changes in deflection are made by moving the sliding leaf, or, if necessary, by moving the aiming point to the right or left.

To determine the elevation in such cases, the sight is first set at zero, and the line of sight made horizontal by the best means available. A reference point is then chosen (as, for example, a mark on the rammer staff, held some distance in front or rear of the gun) to facilitate bringing the line of sight back to the horizontal, when the sight is set at the designated range. The sight is then set at the initial range; the gun is elevated until the line of sight is again horizontal; the rear sight is then lowered until the sights are directed on the aiming point. The gun is now at approximately the correct elevation, and the sights are on the aiming point. Further changes in range may be made by raising or lowering the sight an appropriate amount, then bringing it back to the aiming point by elevating or

depressing the piece. The amount the sight has to be raised or lowered, for a given change in range, say 100 yards, is in the amount measured on the sight strip for the actual range, not the sight-bar range, and may be taken from the sight bar itself, without reference to range tables.

Section VI.—SPECIAL SITUATIONS

12-140. If an aiming point visible from all the guns and from the observing station can not be found, then some expedient must be devised for directing the guns upon their targets. The following are given as examples of such expedients:

Example 1.—The guns are in a depression and all view of the surrounding country is cut off. No natural aiming points are available. The fire-control officer, mounted on an improvised observing tower, can see the target provided his tower is placed in rear of the third piece.

Solution.—He places his tower in rear of the third piece and, looking over the line of metal, directs the gun upon its appropriate part of the target.

He causes the pointer of the third piece to turn his panoramic sight upon the centers of the rammer staffs held vertically at the sights of each of the other pieces in turn and to read off the corresponding deflections. For pieces to the right of the third piece this deflection is increased 3200; for pieces to the left it is diminished by 3200. The resulting deflections are in each case set off on the sights of the respective pieces, and they are then laid, using the sight of the third piece as an aiming point. **Parallelism** of the lines of fire is thus secured.

The deflection of each piece may then be measured from an artificial aiming point.

Example 2.—Suitable aiming points can be seen from the guns, but none of them are visible from the observing station, which, on account of the lay of the ground, must be placed about 400 yards to the flank of the guns.

Solution.—The fire-control officer decides to designate his telescope as a temporary aiming point. He determines the deflection of the directing piece as follows:

(*a*) Sets the telescope at 3200; directs it upon the sight of the directing piece and clamps the lower limb; unclamps the upper limb, directs the telescope on the target, and reads the angle.

(*b*) Computes the offset from the target, in the usual manner, and adds it if on the left flank, subtracts it if on the right flank of the guns. The result is the deflection of the directing piece, the telescope being the aiming point.

(*c*) The directing piece, being pointed according to this deflection, ma then be referred to any suitable aiming point, and the deflection difference calculated in the usual manner.

Example 3.—Observing station such that no data for computation can be obtained.

Solution.—A single round is fired from one of the pieces, and the deflection corrected from observation.

Or, two men may be posted between the gun and the target so that one can be seen from the gun. The one nearest the crest must see the other and the gun. The one nearest the gun must see the other and the target. By directing one another, these men can establish the line from the gun to the target.

Example 4.—The necessity for taking full advantage of cover for the concealment of the guns, especially for aircraft, may sometimes make it impossible to utilize a common aiming point or to see one piece from another.

Solution.—The fire control officer causes the pieces to be pointed by the compass or other means, as nearly as may be in the proper direction. One of the pieces is selected to fire a single round of time shrapnel so as to give a burst about 10 mils above the horizon visible from the guns and at as great a range as practicable. The remaining pieces are so elevated and the sights are so set as to enable each pointer quickly to turn the rotating head of his panoramic sight upon the burst without disturbing the laying of the piece. Each gun captain, having noted the deflection, causes the pointer to turn the sight on any suitable aiming point without disturbing the laying. The reading on the aiming point selected is then diminished by the reading on the burst if this latter reading was less than 3,200. If the reading on the burst was greater than 3,200 the reading on the selected aiming point is increased by the difference between the burst setting and 6,400. The deflection obtained by making the corrections just indicated is then set off on each sight and each pointer brings his cross hairs on the aiming point selected, by traversing the piece. This results in the pieces all being laid on the point of burst of the shot fired.

Measurement of Angles

12–141. Angles may be measured in mils by means of the telescope, the sextant telemeter, the ruler, the scale in the field glass or its known field of view, or by handbreadths.

The telescope and the sextant telemeter[1] are instruments of precision. The graduated field glass affords means of measuring angles accurately. When neither the telescope nor sextant telemeter is available, or when time does not admit of their being set up, use may be made of the less reliable means, practice with which will insure considerable accuracy.

12–142. As the ruler[1] is already graduated, the distance at which it should be held from the eye so that its graduations will cover corresponding spaces on the scales must be determined by trial. Usually this distance is then fixed by tying the ruler cord to the clothing or by knotting it and holding the knot in the teeth.

When the hand is used for annular measurements, its distance from the eye should be such as may be assumed naturally and uniformly and maintained without fatigue. The portions of the scales then covered by different parts of the hand can be determined and memorized.

Average values are given below, it being presumed that the hand is held vertically, palm outward, arm fully extended to the front:

	Mils
Width of first finger at second joint	40
Width of second finger at second joint	40
Width of third finger at second joint	35
Width of little finger at second joint	30
Width of first, second, and third fingers at second joint	115
Width of first, second, third, and little fingers at second joint	150
Width of thumb	40

The width of the field of view of the field glass can be determined similarly and quite accurately divided by eye into halves, quarters, and eighths.

In making the above calibrations the operator must stand at the position of the instrument used in establishing the scales.

12–143. Errors of measurement and calculation and the time required increase with the angles, particularly if the rougher methods are used. It is important, therefore, to reduce large angles as much as possible by resort to various expedients.

For example, an assistant may sight across the face of the object glasses of the field glass upon the aiming point or target. The observer may then select an auxiliary point on a right line perpendicular to the line to the aiming point or target. An angle that must be measured may thus be reduced by as much as 1,600 mils.

Firing Over a Mask

12–144. When a position for masked fire is to be occupied it is necessary to make sure that the projectiles from each gun will clear the mask and reach ground which is occupied or is expected to be occupied by the enemy. Any space within range, which can not be so reached, is called **dead space.**

12–145. If the guns are already in position and the **mask is not more than 200 yards in front,** the guns may be given the elevation and site corresponding to the nearest expected position of the enemy, and a glance through the bores will tell whether the projectiles will clear the mask. At greater distances, or if any doubt exists, lay the gun as before; then set the sight at the range to the highest part of the mask and glance through the sights. If the line of sight clears the mask, the projectiles will clear it also.

12–146. Frequently it is necessary to determine whether or not the guns will clear the mask, before they arrive. In such cases it is necessary to decide what are the shortest range and lowest site which will be used. The height of the trajectory at the distance of the mask is then determined and compared with the height of the mask.

12–147. If the battery commander's rule is available, the height of the trajectory in mils may be calculated for any given range and distance to the mask. (See Bureau of Ordnance Pamphlet, "three-inch Field and Landing Guns and their Ammunition.")

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[1] For method of use and adjustment, see Bureau of Ordnance pamphlet, "Handbook of 3-inch Field and Landing Guns and their Ammunition."

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If this is not available, there are several approximate methods which may be used.

(1) The angles of elevation of the 3-inch field and landing guns are:

Range to target in yards	3-inch field gun, M. V. 1,150 F. S.	3-inch landing gun, M. V. 1,650 F. S.
	Mils	*Mils*
1,000	40	23
2,000	90	57
3,000	150	100
4,000	225	160
5,000	----------	230

These angles may readily be memorized for a given gun. If the site of the crest observed by a man kneeling at the gun position, measured by handbreadths is less than the elevation for the range, the projectile will clear the mask, if the mask is close at hand. If farther away, the necessary clearance may be given by subtracting about 5 mils from the elevation, for each 100 yards the crest is distant from the guns. In using this method the site of target must also be considered, by subtracting from the elevation the amount the site is less than 300, or adding the excess over 300.

(2) When the position considered is on the reverse slope the possible positions in which the guns may be placed may be determined as follows: The observer, dismounted, places himself so that the target or terrain on which the target is expected is just visible over the covering crest. If the distance of the observer to the crest is 40 yards (landing gun) or 25 yards (field gun), or over, the guns may be placed anywhere on the reverse slope so long as this slope remains approximately regular and yet be able to clear the crest at ranges of 2,000 yards and over.

This method rests on the assumption that the height of the eye of a man is about 2 yards above the ground. Since the observer is so placed that the line from his eye to the target is tangent to the crest, the slope, when he is 40 yards from the crest, is 1 in 20. A slope of 1 in 20 is equivalent to an angle of 50 mils, which corresponds to a range of 2,000 yards for the landing gun.

If the observer is mounted, the distances are 60 and 40 yards, respectively.

(3) When mountains are visible in the direction of the targets, or when certain cloud conditions exist with sufficient stability, it is sometimes possible to locate a point at a height above the target equal, or nearly so, to the elevation corresponding to the range. When this is possible the position of the guns giving the maximum defilade may readily be determined as follows: From the covering crest select the nearest target, or point, on which fire is to be delivered. With the hand lay off above the target the corresponding elevation and locate the resulting point. Moving down the reverse slope the guns can be placed anywhere so long as this auxiliary point is visible by a man kneeling. For example, from the covering crest the observer locates the nearest target and estimates its range as 2,000, for which the elevation is 50 mils. Laying off a vertical angle of 50 mils from the target he locates a certain natural feature. He then goes down the reverse slope until this feature is just visible above the covering crest. This position is that giving the maximum possible defilade. If the resulting position is several hundred yards away from the crest, allowance must be made for the drop of the trajectory from the line of departure. Ten mils, for example, may readily be allowed by determining the position from which the located point will appear at that angle above the covering crest.

(4) Whatever the method by which determined, the fact that the guns will clear the mask should be verified after the guns arrive, by glancing through the bores.

Section VII.—CONDUCT OF FIRE

General Provisions

12–148. To render effective assistance upon the battle field, artillery must be able to deliver a timely and overpowering fire upon any designated part of the enemy's position.

12–149. Those areas of the hostile position within which fire is to be delivered by particular artillery units are called **sectors.** They are usually described by

reference to prominent points of the terrain. Within, and sometimes outside, the sectors assigned, fire must be delivered upon objectives called **targets.**

12–150. The officer charged with the conduct of fire must be the master of the fire of his guns. He must be able to turn the fire promptly upon any target at will and to regulate its intensity and distribution as circumstances require. The attainment of this condition requires on the part of the officer complete familiarity with the weapons at his disposal and skill and quick decision in their use, and on the part of the organization thorough knowledge of the matériel, uniform and reliable service of the piece, cooperation of all parts, and strict fire discipline.

12–151. Owing to inaccuracies in the determination of firing data, to the influence of weather conditions, to errors made in the service of the guns, and to imperfections in matériel and ammunition, fire must be delivered and, on the basis of observations, corrected to insure effectiveness upon the target. Fire of this nature is called **fire for adjustment.** During such fire effect is desirable.

When fire has been thus adjusted, it must be continued, often with changed data, to secure effect. During such fire continued observation is necessary. Fire of this nature is called **fire for effect.** In addition to physical effect, artillery may produce important effects of **neutralization, moral support,** or **diversion.** These will be the more surely obtained if accompanied by great physical effect, but they may be obtained though physical effect is slight. These effects are to be considered in the decision to start or stop the fire or to vary its intensity.

12–152. For adjustment of fire, a knowledge of how to manipulate the trajectory, combined with accurate observation, or "spotting," are essential. These will be taken up in turn, after which the details of adjustment will be considered, alone and in relation to the different classes of targets.

Manipulation of the Trajectory in the Plane of Fire

12–153. The location of the trajectory in the vertical plane depends upon the site and the elevation. It may be changed by changing one or the other of these elements, or the same location may be retained by making the proper changes of both in opposite senses.

A variation of the site affects the range the same as an equal variation of the elevation.

The height of burst under normal conditions depends only on the site and the corrector.

If the site only is varied, the point of burst is displaced in height, but not in range; if the corrector only is varied, the point of burst is displaced at the same time in both height and range. Simultaneous and equal but opposite changes of site and corrector cause no change in height of burst, but the burst range changes.

The burst range depends only on the fuze setter range and corrector settings. It is increased or diminished by increasing or diminishing the fuze setter range or by lowering or raising the corrector.

The points of burst of two or more rounds are not coincident unless these three elements remain constant, or unless all three change at the same time by suitable amounts and in the proper relation.

Section VIII.—NOTES ON "SPOTTING" OR OBSERVATION OF FIRE

12–154. The point of burst or impact is determined partly by the characteristic appearance of the smoke of the bursting charge, partly by its location relative to the target and partly by physical effect on the target or terrain.

"Spotting" Bursts in Air

12–155. A burst in air produces a ball of smoke which ordinarily remains together for an appreciable time, and the smoke white or light gray in appearance, is projected in the direction of the trajectory. The point of burst is therefore always above the center of the smoke ball. At ranges beyond about 2,000 yards the point of burst is near to or above the summit of the smoke ball, and the latter, observed from near the plane of fire, is seen in a pear-shaped form, small end uppermost.

12–156. An air burst after ricochet gives a pear-shaped smoke ball, with the broader end up.

Occasionally a burst in air close to the ground will give a flattened smoke ball discolored by dust or mud in considerable quantity, caused by the impact of a large number of bullets on a small area.

"Spotting" Bursts on Impact

12–157. When a common shrapnel bursts on impact, the smoke ball is discolored and fugitive, its upper portion wide and irregular but somewhat flat.

12–158. When a shell or high-explosive shrapnel bursts on impact, a large irregular columnar mass of black smoke and dirt is formed, which remains visible for some time.

12–159. The bullets and fragments from a burst in air knock up a considerable amount of dirt and dust if they strike dry soil; on wet soil splashes of mud are knocked up by the shrapnel case and large fragments. Occasionally the effect of bullets and fragments may be observed in the flattening of long grass or in the movement of brush or tree branches.

12–160. An air burst of high-explosive shrapnel is followed by a percussion burst of the head. Care should be taken to distinguish the impact burst of the head from a graze burst of the whole projectile.

"Spotting" for Height of Burst

12–161. The height of a burst is measured or estimated from the bottom of the target to the point of burst if the target is not concealed in trenches or behind a crest; otherwise it is measured from the summit of the covering crest.

12–162. The height of a group of bursts is the mean of the individual heights of burst.

"Spotting" for Range

12–163. It is rarely possible from a position near the guns to estimate with accuracy the amount of the error in range. Such estimates are usually too small and cause delay through an effort to correct the fire by making timid and insufficient changes in the range.

Attention should rather be concentrated on deciding, from careful observation of each shot, upon the sense of a number of shots fired with the same range and site, and on quickly inclosing the target with fire which is surely short and fire which is surely over.

If the sense of a shot can not be definitely decided upon, it is doubtful, and should be disregarded.

12–164. The most accurate sensing of range is based on observation of effect on the target. Next comes observation of bursts on impact, then of effect on terrain, then of the position of the smoke ball with respect to the target.

12–165. If the observer is considerably above the target, or the target is on ground sloping toward the observer, the sense of a salvo (**short** or **over**) may usually be recognized readily by noting the relative position, with respect to the target, of graze bursts of the projectile.

12–166. If the outlines of the target are more clearly defined against the smoke of the burst, the range may always be considered as **over**, whether the burst occurred in air or on graze.

12–167. If the target is obscured by the smoke of the burst, the range may be considered as **short**; but, in the case of a burst in air, the burst must be **low** in order to warrant this conclusion.

12–168. If the target is indistinct and of about the same color as the smoke, it may be less visible against the smoke as a background. A burst beyond the target may, for this reason, sometimes seem to obscure the target, and hence be judged **short**, when it is in reality **over**. On the other hand, some targets become very much more visible if projected against a smoke background.

12–169. Frequently the target occupies terrain of such a nature as to justify sensings of rounds, when the deflection is known to be approximately correct, as **lost over**. But soft or swampy ground may completely smother a burst and prevent sensing.

12–170. If the wind is blowing **up** or **down** the range, a decision should be formed quickly as to the relative position of the smoke with respect to the target. But if the wind is blowing **across** the range, it may be better to wait until the smoke has drifted across the front or rear of the target. To secure this result it may be desirable to direct the fire at the windward flank of the target.

12–171. In observing bursts with reference to a crest, care must be taken not to be deceived by a crest parallel to the crest sought, but short of it. In rolling

country such an intermediate crest is often present, and it may merge into the background formed by the higher ground in its rear, and hence escape detection, while, as a matter of fact, there may be a broad valley or depression between the two crests. Shots observed against the near side of the intermediate crest are short and easily sensed, but shots which pass over the intermediate crest and burst low or on graze in the valley between the two and are lost, may be thought to have cleared the farther crest and erroneously sensed as over. Such deceptions may be avoided by obtaining bursts in air on the line joining the observer and the crest sought. If the ball of smoke is cut in two by the crest and the crest clearly defined against it, the burst is **over**. If the crest is concealed by the smoke, the burst is **short**. The short burst may often serve to reveal the existence of the intermediate crest by causing the latter to be silhouetted against the smoke.

12–172. When the burst is in the direction of a wood the smoke ball may present a ragged appearance due to its being partly hidden by branches or foliage. The indication is that the burst is beyond the near limit of the wood.

12–173. If the sun is shining, information as to the sense of burst in air may often be obtained by observing the shadow of the smoke ball on the ground. The height of the burst and the position of the sun must, however, be taken into consideration.

12–174. Observations of range from lateral positions are complicated by errors of direction. But if the direction is correct all shots seen by the flank observer will be over if they appear beyond the target, and short if on the near side.

12–175. An accurate conception of the terrain in the vicinity of the target increases the number of rounds which may properly be called sensible. Preparatory to opening fire the study of ground forms around the hostile positions should be taken up, and this should be continued during the action.

Auxiliary Observing Stations

12–176. Auxiliary observers may frequently be used with advantage at stations near the targets or at a considerable distance to a flank of the line of fire. Elevated stations are particularly favorable. In the selection of such stations the most important requirements are a plain view of the target and its adjoining area, cover from hostile discovery, and sure and swift communication with the stations to which they are auxiliary.

12–177. With respect to the adjustment of fire, they indicate especially whether the range is **short**, **over**, or **correct**; whether the **burst interval**, when in front of the target, is too **great**, too **small**, or **correct**; whether the direction is **right**, **left**, or **correct**.

If large errors in range are made, an observer on the flank of the guns will not usually be able to separate the errors in range from those in direction; in such a case the observer would ordinarily signal the direction only, as **right** or **left**, as it appears to him, and the officer conducting the fire, knowing the position of the observer, would deduce the sense of the salvo, volley, etc., in range.

12–178. With respect to movements of the enemy, the observer reports especially: If the enemy abandons his position; if he shifts to the right or left, front, or rear to escape effective fire; whether hostile reinforcements enter the sector and their location.

12–179. With respect to our own troops, the observer makes such reports as to their movements and situation as will enable the artillery commander best to assist them with the fire of the guns.

12–180. Arrangements should, moreover, be made to obtain from advanced troops information which will assist in the adjustment of fire, and indication as to when fire should be commenced or discontinued.

12–181. Auxiliary observing stations are sometimes established in captive balloons or mobile aircraft, and are of great assistance in the study of terrain and the location of targets, or in "spotting."

The designation of objectives is difficult. It is possible, however, by several methods, such as by photography, by sketches, by reference to squared maps, by description, or by their relation to reference points.

12–182. In observation of fire from a great height, bursts in air and bursts on graze may both be seen, but it is difficult to judge the height of the burst center except by the ratio between the number of air bursts and graze bursts. In both range and direction the relation of the shots to the target is easily determined.

Section IX.—FIRE FOR ADJUSTMENT

12–183. Adjustment may be dispensed with only when the necessary data have been determined by previous fire, or when the range is very short. The greatest difficulties arise from errors due to personnel, rather than matériel; for example, from failure to set the scales exactly as ordered or to center the bubbles; from not noticing and correcting any derangement of the laying due to loading or of the settings due to firing; from not turning the projectile in the fuse setter in the proper manner and from similar mistakes.

12–184. Adjustment is effected upon the target itself, if practicable. In many cases, however, the target will not be visible to the officer conducting the fire, though its approximate position may be known. Thus, the target may consist of troops concealed behind a ridge, or behind a wall or hedge, or in the edge of a village, a forest, or a field of standing grain.

Some prominent feature of the terrain in or near the enemy's known positions—for example, a tree, a house, a mass of rock, etc.—is then selected as a **registration mark**, and by means of scouts, observers in balloons, or any available means, the enemy's location with respect to this mark is determined within the narrowest possible limits.

The fire is then adjusted upon the registration mark, and the area within which the target has been located is searched by the subsequent fire.

12–185. If the circumstances permit, advantage may be taken of lulls in the action to secure at least a rough adjustment upon localities in which the enemy is known to be, or near which he is expected to appear. Such a fire is termed **fire for registration.** The data are thus secured for opening promptly an effective fire upon an enemy appearing at or near the positions upon which the fire has been registered; by minor modifications in these data a quick adjustment on the target may be secured.

12–186. Adjustments of four kinds are required, viz.:

1. **Adjustment for direction.**
2. **Adjustment for distribution.**
3. **Adjustment for height of burst** (time fire only).
4. **Adjustment for range.**

Adjustment for Direction

12–187. When direct laying is employed, the battery commander makes such changes in deflection as may be necessary to bring the fire of each gun to bear upon its proper portion of the target. When shots go wide of the target it should be more accurately designated.

12–188. When indirect laying is employed, the error of the piece which is most nearly directed upon its proper part of the target is measured or estimated in mils and a corresponding correction in deflection is applied in the appropriate sense.

Adjustment for Distribution

12–189. A change in deflection difference is based on the observation of the preceding salvo. It should be made on the piece which, for that salvo, is nearest to its proper direction, or on which the deflection is changed.

12–190. As adjustment progresses the fire may be either concentrated or distributed. If observation is difficult, concentration upon the most prominent part of the target may be advisable; if at the same time a cross wind is blowing a point of adjustment to the windward of the target may be selected.

12–191. If several batteries are adjusting simultaneously upon a single broad target, it is generally best for each to concentrate during the adjustment upon the corresponding part of its section of the target—for example, the windward flank.

12–192. The simultaneous adjustment of fire by several batteries upon the same target should not be attempted unless it is possible to distinguish clearly the shots of the different batteries firing; the adjustment should be made by one battery only and verified by the others in turn.

Adjustment for Height of Burst

12–193. For adjustment of time fire a low burst center giving a large percentage of bursts on graze is desirable. The opportunity is thus given to observe both bursts in air and bursts on graze. Moreover, considerable effect may be

produced during the adjusting series, and by a small change in the corrector, passage to fire for effect may be quickly accomplished.

12–194. When the mean point of burst is at a height appropriate for adjustment, about one-third to one-half of the shrapnel may, on account of errors of the fuse, of laying, etc., be expected to burst on graze.

This indicates a mean height of burst from zero to 1 mil above the target. Wild shots should be disregarded, as being probably due to incorrect laying.

12–195. When indirect laying is employed, an error in calculating the site will cause a corresponding error in height of bursts. As the cause of the latter error may not at first be known, adjustment of the height of burst by changing the corrector may be attempted. If the error in height of burst is not great, it may be readily be allowed for in this way; but if it is seen that the necessary correction will exceed the limits of the corrector scale, the total correction which has been applied to the corrector must be transferred in the same sense to the site, and a return to a corrector setting near the normal must be made.

Similarly, for direct laying, a change of site may be made instead of corrector, to avoid exceeding the corrector scale.

Adjustment for Range

12–196. Adjustment for range is usually the most difficult to obtain.

12–197. The refinement to which fire for adjustment can be carried depends on conditions. Many targets are able to shelter themselves from fire. Hence early physical effect must be obtained unless moral effect only is sought. In time fire there is necessarily a moment when adjustment must cease, for the most suitable height of burst for producing effect is not a suitable height for observing for range. For all those reasons, then, adjustment for range usually consists in determining two ranges, one of which is less than the true range of the target and one of which is greater. The determination of these two ranges is called **bracketing** the target. The difference between the two ranges is called the **bracket.**

12–198. If the target is surely included within the limits of the bracket finally accepted, it may be reached more or less effectively by subsequent fire. The first consideration, then, is to determine that fire at a certain range is surely short of the target, and that fire at another and longer range is surely over the target. A second, but very important consideration, is to reduce the difference between those two bracketing ranges as much as possible.

12–199. If the first range is **short**, the range is increased; if **over**, it is decreased and rounds are fired successively, increased or decreased in range, as the case may be, until the target is bracketed.

Having bracketed the target, the size of the bracket may be successively reduced by halving the last bracket obtained; that is, by firing at the mean of the last two bracketing ranges.

As the depth of the bracket decreases, so should the number of observations on which each limit is based increase.

12–200. The amount of changes in range for obtaining the first bracket depends upon the accuracy of preparation of fire and the nature of the target.

12–201. When ranges are estimated or taken from a map on which the positions of guns and target can not be accurately located, the first bracket should be obtained by changes of 400 yards.

When an accurate range finder has been expertly used, or when the range has been accurately determined by other means, 200-yard changes are appropriate.

12–202. In firing over friendly troops near the target the bracket may be obtained by smaller successive changes of range.

12–203. If the sense of the bursts is **doubtful**, or if the bursts are lost, circumstances must decide whether to change the range or to change only other firing data for the next round.

If the smoke of the fire of other batteries has interfered with observation, a salvo concentrated upon some prominent part of the target may be of assistance.

If the doubt was occasioned by the fact that the bursts were in air and high, it may be well merely to lower the point of burst for the next salvo.

If a salvo is lost, the projectiles have probably burst wide of the target or in a ravine or behind some intervening cover. If the smoke of the bursts does not rise and become visible after a few seconds, the lay of the ground should determine whether to increase or diminish the range or merely to raise the corrector so as to obtain visible bursts in air. Definite information may generally be most quickly obtained in such cases by securing time bursts just above the level of the crests or other cover.

12–204. The trajectory may be brought upon the target by changing the site or by changing the range setting. In the latter case, if the site is in error the fuse will be set for a range other than the true range to the target, and the projectile will burst too high or too low, as the case may be. Modifications of the corrector or of the site will in general be necessary to bring the mean point of burst to the desired height. If the error has been small, it may readily be overcome by a proper use of the corrector.

12–205. In the accurate adjustment of time fire, not only the height but also the burst interval is important; for projectiles bursting too far in front of the target and those bursting in the air above it produce little or no effect. The burst interval is correct when both the range and the height of burst are correctly adjusted. Indications that such is the case are: (1) That the bursts on graze bracket the target; (2) that the mean height of burst is about 3 mils; (3) that fragments from the air bursts strike the ground both in front and rear of the target, and that the pattern made by these fragments, as revealed by the dirt and dust knocked up, is close and dense rather than greatly extended; (4) that obvious effect is produced upon the target.

If doubt exists as to the burst interval, it is best to lower the corrector and get a group of low bursts or bursts on graze.

12–206. At medium ranges a change of 4 mils in the site produces a change of about 100 yards in range; hence, if the site is materially altered, the adjustment of the range will have to be recommenced.

12–207. At medium ranges a change of 4 points in the corrector produces a change of about 100 yards in burst range.

12–208. If percussion fire is to be used for effect on material objects, called **fire for demolition,** very accurate adjustment of range is required. Such fire is effective at all ranges but, because the probable error in deflection increases and the danger space decreases, while observation grows more difficult as the range becomes longer, effect can often be obtained at the longer ranges only at the expense of much ammunition.

Percussion fire may be said to be adjusted only when effect is plainly observed, or when, of many rounds fired at a single range, the number of **overs** is equal to or slightly greater than the number of **shorts.**

Method of Fire for Adjustment

12–209. The method of fire depends on the target—its nature, size, condition and range; the method of laying, conditions of observation; firing data already determined, and other considerations.

12–210. Fire by battery salvo has the advantage of increasing the chances of discovering abnormal errors of gun service and of observing more than one round, thus establishing quickly the basis for changes of direction, height of burst, and range. When the range has been accurately determined it increases the probability of obtaining both shorts and overs at the first salvo and effect on a wide front of the target. It also has the advantage of at once setting all of the trail spades.

Fire by piece is appropriate to check a very doubtful deflection and, in some cases, for fire for registration.

Salvos insure the identification of individual rounds and, with the exception of distribution, more accuracy in observation of fire. They are favorable to accurate service of the piece.

Volleys are faster than salvos and give better observation of distribution.

Salvos usually commence on the leeward flank of the guns, in order that the burst of one round may not be obscured by the smoke or dust of the other.

12–211. The rapidity of fire during adjustment will be controlled by the necessity of observing the shots and setting off the necessary corrections. Rapid and correct decisions and quick commands on the part of the battery commander will increase the rapidity of the adjustment of fire.

12–212. The kind of projectile to be used in adjustment is ordinarily the kind that is to be used for effect. The choice depends upon the nature of the target and its situation.

During fire for effect time fire is, as a rule, employed against animate targets, aircraft, searchlights; percussion fire against other inanimate targets.

During adjustment it may become necessary to change from time fire to percussion fire to lessen the probability of hitting friendly troops or for the purpose of narrowing the bracket.

Classes of Targets, Appropriate Methods of Fire, and Brackets

12–213. Targets are classified with reference to their nature, as **artillery, infantry, machine guns,** etc. They are also classified according to their movement, or power to move, as **fixed** or **stationary, transient,** and **moving.** All of these may, of course, vary as to size and as to degree of movement.

Fixed, or stationary, targets are targets which are fixed to their position for at least a considerable time. Examples of such targets are buildings, trenches, artillery in position, troops held under cover by fire.

Transient targets are those which while fully exposed to fire are likely to remain so for a very brief time. Examples of such targets are infantry skirmish lines, machine guns, observation parties.

Moving targets are those which are changing their location. Examples of slowly moving targets are large bodies of troops on the march, infantry whether on the march or advancing to the attack, wagon trains on the march. Examples of rapidly moving targets are artillery at fast gaits, charging cavalry, cavalry at fast gaits, small bodies of mounted men, motor cars.

12–214. Against **fixed targets** salvos are ordinarily used during fire for adjustment, which is usually continued until a suitable bracket has been obtained. A bracket of 100 yards should ordinarily be sought; either time or percussion fire is used, depending on the target.

12–215. Against **transient targets** salvos are usually appropriate during fire for adjustment, time fire being used.

A bracket of 200 yards is usually the narrowest that can be attempted. In extreme cases it may be necessary to assume a bracket of considerable depth, based on the observation of the first bursts. Volleys are used in fire for effect. Against instantaneous targets, such as reconnaissance parties, no bracket is sought, but time fire is executed over a wide front and great depth, at maximum rapidity.

12–216. Against **large targets moving slowly,** such as heavy artillery, troops in defiles, wagon trains, etc., either direct or indirect laying may be used.

In direct laying, volleys are usual during fire for adjustment, as this method gives the pointer more independence in the instant of firing, and he is better able to take advantage of the movement when the target is most visible. In indirect laying, salvos are usual during fire for adjustment. Time fire is used. A bracket of 200 yards should ordinarily be attempted. Volleys are used in fire for effect.

12–217. **Against rapidly moving or small moving targets,** or targets likely to move rapidly, volley fire is usually appropriate, both in fire for adjustment and fire for effect. If the motion is in direction of the range, a bracket of 600 yards is usually the narrowest that can be attempted. Time fire is used. If the target is small, indirect laying is usually ineffective; aerial targets come in this class.

(See also detailed discussion of different targets, under "Fire for Effect," art. 12–231 et seq.)

Section X.—FIRE FOR EFFECT

12–218. Every target attacked will present its own problem, which must be solved according to existing conditions and not by adhering to any fixed rule.

Having completed preliminary adjustment and opened fire for effect, observation is continued, and such corrections are made as will serve to perfect the adjustment or meet changes in the location or formation of the target.

Range in Fire for Effect

12–219. It will seldom be possible to obtain an adjustment close enough to justify remaining at a single range during the delivery of fire for effect. The short and long limits of the bracket should be considered as inclosing an area to be covered at successive ranges. This can be accomplished by using either successive increments or successive decrements, so that the target will be covered at one or more of the ranges used. The officer conducting fire may be able to form an opinion as to which are the most effective ranges. The first range differences should usually be 100 yards, but when the area has been narrowed as a result of observation they may be reduced to 50 yards.

12–220. In firing at moving targets the first range used should ordinarily be that limit of the bracket toward which the target is moving.

The first range appropriate for other targets depends upon consideration of the purposes of the fire for effect, the conditions of observation, the position of friendly troops.

12–221. In firing over friendly troops advancing to the assault, fire at the target should cease upon a suitable signal from the infantry that the fire is dangerous. The exact time depends on the range, terrain, and conditions of observation. The range may be increased to hinder the bringing up of hostile supports or to cause losses should the enemy fall back.

At medium ranges over level ground the danger space to infantry from well-adjusted time fire extends for a distance of about 300 yards in front of the target. This distance becomes less if the ground rises toward the target; greater if it falls toward it.

Height of Burst (for Effect)

12-222. A height of burst from 2 to 4 mils is theoretically best, the effect varying little between those limits and decreasing rapidly outside. But a low burst is better than a high burst, and latest information from actual firing seems to indicate that a mean height of about 2 mils is generally most effective.

Distribution (for Effect)

12–223. The fire of a battery is usually distributed over the front assigned it for attack.

When time fire is employed the following considerations are to be borne in mind:

(a) If the front to be attacked does not much exceed 12 mils in width, it is sufficient to converge upon the center of this front, as the dispersion of fire, when a considerable number of rounds is fired, will provide for covering the full front.

(b) Fronts which do not much exceed 35 mils may be covered effectively by a 4-gun battery using distributed fire.

(c) If the front much exceeds 35 mils, it may be divided into sections and each section attacked in turn.

12–224. In shrapnel time fire the right piece is directed not upon the right edge of the target but upon a point about 10 yards inside of the right edge. To direct the left gun upon a corresponding point inside the left edge, the divisor of the front of the target is the number of guns **firing**, not that number decreased by one. (See art. 12–122, Distributed Fire.)

12–225. When the mean height of burst of shrapnel is well adjusted, each gun is expected to cover effectively a front of 20 yards if one round is fired, 25 if two are fired.

12–226. When **percussion fire** is employed, the nature of the target determines whether converging or distributed fire is to be employed.

If the target to be attacked has a continuous front, e. g., walls, obstacles, etc., this front may be divided into sections of 10 mils each and the sections attacked in turn, each gun taking its proportionate part. If the target has a much smaller front than 10 mils, the fire may be converged upon its center. If the target consists of artillery, each gun may be assigned a corresponding gun, depending upon the amount of artillery available.

Method of Fire (for Effect)

12–227. The **rapidity** with which fire for effect should be conducted depends principally upon the tactical situation. After adjustment has been obtained the volume of fire may be increased, by increasing the number of pieces, or by firing in more rapid succession than is practicable during fire for adjustment, or by increasing the number of rounds in each volley.

Rapidity of fire must never be so great as to prevent fuzes being exactly set and the guns accurately laid, or otherwise to interfere with the work of the gun squads.

Great rapidity of fire is permissible only for a short time. The expenditure of ammunition is otherwise too great.

12–228. **Volley fire** is adapted especially to the attack of fugitive targets that are more or less vulnerable. The special characteristic of this method of fire is its great flexibility and rapidity. The number of volleys to be fired, their range difference, the number of rounds in each volley are all in the hands of the officer conducting the fire. By suitable manipulation of the sheaf he may readily shift the fire from point to point of the terrain, as necessity may require, and by adapting the bursts of fire to meet the crises of the action he may utilize the ammunition to the best advantage.

12–229. While **salvos** are adapted especially to securing the adjustment of fire, they may also be used for producing effect, especially with the idea of obtain-

ing at the same time additional information on which to base a closer adjustment of the fire. They are employed according to the principles of volley fire.

12–230. **Fire at will** is employed solely for the close defense of the guns.

Against a slowly moving enemy, such as infantry, the fire should be commenced when he has arrived within about 350 yards of the gun; against a rapidly moving enemy, such as cavalry, when he has arrived within about 800 yards; the purpose in both cases being surely to establish a fire-swept zone through which the enemy must pass in order to reach the guns.

Obstacles—Intrenchments

12–231. Many obstacles may be destroyed by light artillery, but always at a price of a large expenditure of ammunition; they are attacked by high-explosive shell or percussion shrapnel.

Defenders behind stone walls may best be reached by demolition of the walls.

Earthworks can only be damaged. The fire directed on them should be destined only for the defenders who are sheltered by them; percussion shrapnel or high-explosive shell will be best.

Woods

12–232. If the borders are occupied, woods are attacked with time fire.

When it is desired to reach troops concealed in the interior of a wood they are attacked with percussion fire.

Reconnaissance and Staff Parties

12–233. These are very important targets, vulnerable, but furnishing only fleeting opportunities.

Time fire is executed over a wide front, with a long bracket and maximum rapidity.

Personnel of Command, Observers, Signalmen, Telephonists

12–234. These are important targets of variable vulnerability. They present a certain fixedness. The front covered is narrow, and the bracket is reduced more and more. Time fire is used, followed by percussion fire if the target is on an observing ladder.

Cavalry

12–235. Cavalry is very vulnerable at a halt and when in close formations. It protects itself against artillery fire through its mobility and dispersion.

Time or percussion fire is used, and all measures are taken to increase the rapidity of the fire. If the firing unit is not placed so as to have a direct view of the target, the sheaf is opened and fire over a deep bracket is commenced when the cavalry enters the area under observation. If direct laying can be used the target is followed by all the pieces, a wide bracket is sought and then searched by volley fire, commencing at the limit which the target is approaching.

The opportunity of firing on cavalry will be fugitive; the fire of short duration. The maximum rapidity of fire is essential whether by time or percussion. When cavalry directs its attack against a battery, the battery will act advantageously in establishing a barrier by percussion or time fire in front of the enemy's line.

Artillery

12–236. Artillery presents targets widely varying in vulnerability. The greatest vulnerability exists from the commencement of the reconnaissance until the occupation of the hostile position is accomplished; that is, up to the moment that the enemy's artillery is ready to fire. Its retirement from under fire is also a most critical moment, especially when the retirement is made by an entire unit.

12–237. Against artillery in position, the first object is to gain the ascendancy over it by inflicting as much damage as possible upon the personnel. Immediate effective fire is particularly demanded if the enemy can be attacked at a disadvantage.

Due to the difficulty, however, of reaching effectively the personnel of batteries provided with shields and posted in masked positions, the struggle between evenly matched artilleries will often be long drawn out. If the enemy's artillery

is temporarily overmatched, it may suspend its fire and shelter its personnel; but it must be expected to renew the struggle as soon as the pressure upon it is relieved. The aim must be to gain the superiority of fire by suitable concentrations of effect on the part of our own artillery; the opportunity may then be gained to destroy the enemy's matériel by well-adjusted shell fire.

If the pieces are not seen, fire for demolition can not be employed without waste of ammunition; but such artillery has nevertheless a certain vulnerability to time fire. There are always observers and members of the gun squad who are incompletely sheltered, and who are less so, generally, when the artillery is firing. The effect obtainable from time fire is increased when the batteries against which it is directed are under an oblique fire.

A sufficient recession from the covering crest or from the mask renders an objective absolutely immune; for it is impossible to attack an indefinite depth of terrain. On the other hand, the greater the distance from the mask which the enemy is forced to take the more difficult become hostile communication and command.

12–238. The varying conditions indicate the following principles governing conduct of fire against an artillery target.

If priority in occupation of position is obtained, careful observation is made of indications of the enemy's reconnaissance and occupation of positions. At the moment of these operations time fire is opened through a large bracket, over a broad front, at maximum rapidity. This will be repeated, if necessary, the adjustment being refined.

If priority of occupation is not obtained, a different procedure is advisable.

When the pieces of the hostile artillery are visible, time fire should be used at first to reach the uncovered personnel and to produce a demoralizing effect. This effect is then extended to the personnel under cover by the use of time fire, the limits of the bracket being reduced as much as possible, and the front covered being limited to the actual front of the target. The effort is continued to destroy the personnel and then the demolition of the matériel by percussion fire is attempted. Fire is delivered on all visible pieces as accurately as possible and continued until that result is obtained, if conditions justify the expenditure of the necessary ammunition.

When the hostile pieces are not visible, their presence may be disclosed by the flashes, by the dust raised by fire, or by other indications. The method of attacking them is similar to that just described, except that study of maps and terrain must be made to establish the far limit of the bracket, the near limit being the covering mask, and that fire for demolition can not be usually undertaken. If it proves impossible to reduce the limits of such a bracket, it is advisable to await the appearance of new indications. The firing unit remains in observation of the target, and a minute search is made for its observers or its battery commander's station. If these are discovered, efforts should be made to destroy them.

12–239. Fire for demolition requires great accuracy in range and direction, thereby necessitating careful observation of each round from each piece. Its employment is permissible only when the nature of the target indicates that fire for demolition must be carried out and when the number of batteries at hand is such as to limit the front to be attacked to about 100 yards per battery. If the target is such that fire for demolition is not admissible, a four-gun battery will give a sufficient volume of time shrapnel fire against an artillery target, however dense it may be, provided the front does not exceed 200 yards.

Infantry

12–240. Infantry, like artillery, offers target of variable vulnerability. But while the artillery of the enemy once in place constitutes a definite target, the infantry target changes form, dimensions, density, and sometimes position from one instant to another. An artillery target may sometimes be destroyed; it is practically impossible to destroy a body of infantry, whose elements avoid fire individually and may sustain fire almost without loss.

Finally, it may be said that artillery is proportionally small in quantity, and that, by reason of the power of even a single piece, each unit or subunit which is seen or is firing is of sufficient importance to be attacked, while the infantry exists in very large numbers, is almost everywhere, but is in fractions of small importance. Because of their weakness these small fractions do not attract fire, or by their multiplicity oblige those who wish to fire against them to disperse their fire. Fire against infantry targets will often fail to produce great losses, but other results may be expected.

12–241. Against infantry in position and more or less protected by entrenchments the intensity of the fire should be regulated to suit the necessities of the case, as our infantry advances to the attack, being slow or ceasing entirely while the enemy is concealed or inactive, rising to great intensity when the crises of the action develop and the enemy exposes himself to meet them. Salvos may be used for the ordinary phases of the action, volleys for the crises, the object being to assist our own infantry by inflicting as much damage as possible upon the enemy; by destroying his morale; by forcing him to keep under cover; and by preventing effective fire upon his part.

12–242. A slowly moving target, such as infantry, or mounted troops impeded in their march, may be quickly bracketed by salvos and then attacked by searching fire.

Infantry in march formation may be thus attacked, but immediate deployment on their part is to be anticipated, and the officer conducting the fire should be prepared to reach them, probably behind cover, with a well-distributed fire.

Infantry moving to attack in deployed lines, a succession of thin lines, or in line of small columns may be met by volleys successively reduced in range as the infantry approaches. If their formation is in line of small columns, the fire should be distributed so that a piece may bear upon each of the columns.

At close ranges infantry will probably endeavor to advance by successive rushes from cover to cover. Such rushes may be met by volleys previously prepared for upon selected positions, evidently in the immediate path of the enemy. If the positions occupied by important bodies of the enemy during the intervals of advance are well defined, accurately adjusted fire may be brought to bear upon such positions, and the ground between successive positions may be covered by searching fire when important movements of the enemy from one position to another are attempted.

Machine Guns

(See next chapter)

12–243. Machine-gun groups have much the nature of infantry attacking, but they are of greater importance than small fractions of infantry on account of their great volume of fire. If they are discovered to be firing, they should be attacked with time fire over a broad front and with a deep bracket. Under the best conditions of observation from a station near the guns the bracket can not usually be reduced below 200 yards. Owing to the ability of the personnel to disperse and to seek cover, the fire must be rapid. Once forced to cease firing, the area containing the machine guns should be kept under close observation, with a view of preventing resumption of their service or their withdrawal for use elsewhere.

Aerial Targets

12–244. Fire against targets in the air generally requires the assignment of particular units to the purpose, the digging of circular trenches about 36 inches deep for the trails to permit the use of high angles of elevation, and the organization of a system of lateral observation with means of sure communication between observers and battery commander's station.

12–245. Captive balloons are very vulnerable within the limits of the trajectory and the action of the fuses. They have slight motion within narrow limits, and are attacked by direct laying with time shrapnel. It is indispensable that the rounds be correct for deflection. Ranging is commenced, unless the range can be measured, at the long limit of the fuse to ascertain whether the balloon is within time-fire distance, and the bracket is obtained and fire for effect conducted by the usual methods except that for effect the burst height should be greater than normal to insure wide dispersion in the shrapnel cone. When a range finder is used, a bracket may be assumed on the basis of the first observations for range.

Dirigibles and airplanes are vulnerable, but very difficult to hit, especially for ordinary field guns. Direct laying is used with time shrapnel. The battery is divided into two parts. Each fires separately, one beginning at the far limit, the other at the short limit, of an estimated bracket as wide as 2,000 or 3,000 yards. Each fires volleys of one or two rounds at ranges differing by 200 yards, the successive ranges approaching the center of the bracket. When the bracket has been covered or when lateral observations indicate that the target is out of the bracket, the process is repeated.

If the range finder is used, a narrower bracket may be attempted.

As aircraft may readily change their direction, height, and speed, deflection and corrector changes will usually be necessary during firing. Essentials of success are rapidity and accuracy in service of the piece, skillful operation of the range finder, and on the part of the officers conducting the fire, quick decision and command and boldness in changing ranges without delay.

Targets with Respect to Terrain

12–246. Targets may also be considered with respect to the nature of the terrain on which they are situated.

An enemy entering the dead space existing in front of a battery can not be attacked by ordinary means. Some effect may be obtained by an early burst at the minimum elevation of the piece necessary to clear the mask. If the corrector scale is not sufficient, the expedient may be used of increasing the site of successive increments of 5 mils each and by decreasing the range 200 yards for each increment of 5 mils. This decreases the range to point of burst by an amount roughly corresponding to an equal change of the corrector. This kind of fire is appreciably effective only within very narrow limits.

On a horizontal terrain with site 300, range 2,000, the effect may be considerable, even when the target is under the highest part of the trajectory. If the range is greater than 2,000 yards, or if the terrain falls off abruptly beyond the mask the effect decreases rapidly and ceases to be appreciable when the target has penetrated the dead space a very short distance.

12–247. If a target is scattered over ground sloping toward the guns, the points of burst may be kept at an effective height above the terrain by making simultaneous changes in range and corrector in the same sense; that is, if searching up the slope, by increasing the range and raising the corrector at the same time.

12–248. If the area to be searched is not deep and the slope not great, a mean value of the site may be taken, and a corrector used which will give low bursts at the near limit of the area if the slope is away from the guns, and bursts slightly above the normal if the slope is toward the guns. This method will always be used if great rapidity is desired. For searching long and steep slopes, however, it is better to use the site of the near limit of the area to be searched and vary the corrector from volley to volley or salvo to salvo, raising it if searching up the slope or lowering it if searching down the slope.

12–249. A target marked by a crest may always be attacked as though it had considerable depth. To overcome the effect of the slope of the terrain, increases of range must be accomplished by lowering of the corrector. The steeper the slope the less will the range be changed and the more the corrector.

For example, if the terrain has a slope of 60 mils, increasing the range setting by 50 yards and lowering the corrector by 2 mils will increase the burst range by about 100 yards; if the slope is 90 mils, a range increase of 25 yards and a corrector diminution of 3 mils will cause a change of about 100 yards in burst range. The height of burst above the point of impact will not be materially changed in either case.

If percussion fire is used, range changes to correspond to normal 100-yard bounds must be less than 100 yards, the amount depending upon the steepness of the slope. Slopes greater than the angle of fall can not be struck by percussion fire.

12–250. Percussion fire of shrapnel may be very effective against animate objects beyond a crest on slopes giving bursts on ricochet. At 3,000 yards ricochet may be expected from slopes of 50 mils or more. The slope most favorable for effect is one of about 115 mils. However, both ricochets and effect are greatly influenced by the character of the soil. When effect by such fire can be obtained, it is possible to avoid complicated changes of corrector to overcome the influence of slopes.

Night Firing

12–251. If searchlights are available, firing may be conducted against targets of all kinds the same as by daylight up to the effective range of the lights. It will often be necessary to fire as at instantaneous targets to take advantage of brief periods of illumination.

In any case preparation of fire should, if possible, be made before dark, and with the greatest possible accuracy.

12–252. To permit of turning fire upon different targets or areas, direction is taken to a principal registration point. The angular distances from this point to the various targets or target areas are then measured and recorded, and also,

the breadth of front of each. If guns have been placed in position, it is well to verify the directions by registration shots.

These data will be entered on a sketch; each target or area will be designated by a letter, care being taken not to use letters of similar sound, and opposite each target will be noted the range, site, corrector setting, deflection from the registration point, and breadth of front.

12–253. If the preparation can not be made before dark, it is impracticable to fire at all, except at illuminated targets. For this purpose an auxiliary observer on a flank is necessary, with whose assistance a broad bracket is obtained, and fire for effect opened upon the bracket with ranges differing by 100 yards. Ranges should be eliminated or added, according to the reports of the auxiliary observer.

Star shells, if available, may be used for illuminating the target, the bursts being adjusted to come over and behind the target, thus showing the target silhouetted against the light.

12–254. For indirect fire at night, stakes carrying lanterns may be provided as aiming points. Similar stakes may be used by observers to fix the directions to targets. Sights must be illuminated.

Section XI.—OPERATIONS IN THE FIELD

12–255. The **characteristics** of field artillery are:

(1) Great power concentrated in a relatively small tactical unit.

(2) Rapidity of fire.

(3) Long range.

(4) Ability to act from concealed positions.

(5) Limited mobility, especially in rough country, and where only man power is available for transport.

(6) Ability in general to defend itself against a frontal attack, but weakness against a flank attack—though the dragmen (supports) assist materially in this regard.

12–256. Employment of fire.—The power of artillery should not be frittered away in desultory bombardments nor upon unimportant targets. Its employment is to be adapted to the phases of an action, so that it may exert the strongest influence upon the important objectives and at the critical moments.

The opportunities of striking an enemy while he is vulnerable are ordinarily intermittent and brief. They occur, for example, when the enemy moves from cover to cover, or when he exposes himself in order to contend effectively against our own troops.

Suddenness of action is thus often a necessity. If the action is also by surprise, effect, especially the moral effort, is increased.

The outburst of rapid fire called for will therefore be intermittent, depending upon the nature and phase of the combat.

A prolonged deliberate fire, however, may be requisite for destroying material objects; for holding a sheltered enemy under subjection, preventing his supply and reenforcement, and precluding his effective interposition in the engagement; for searching for an enemy's reserves, etc.

Opportunities for using flanking and oblique fire must be sought.

These methods of action are made possible and effective by timely reconnaissance, by skillful selection and occupation of positions, by careful preparation and an efficient conduct of fire, and by thorough cooperation with other troops.

12–257. Preparatory dispositions.—Premature commitment of artillery to action is to be avoided.

Readiness for action is secured and freedom of maneuver retained by posting artillery in or near suitable concealed positions, and making all preparations for meeting the probable phases of the action.

12–258. To facilitate definite assignment of duties, batteries are classified as follows:

(1) **Counterbatteries** are those specially designated to combat the enemy's artillery.

(2) **Infantry batteries** are those assigned to prepare and support the infantry attack. They are further classified into **batteries of preparation** which fire on the opposing infantry; and **breaching batteries,** whose mission is to open passages in the enemy's line, through which our troops may advance.

(3) **Batteries of the counterattack,** to assist in defeating any counterattack the enemy may make. They are posted in observation or readiness.

(4) **Decoy batteries,** to draw the fire of the enemy's artillery which has not disclosed itself, or to divert their fire from the main attack. They are usually

posted in an advanced position, at wide intervals, and make up for small numbers by great rapidity of fire.

(5) **Accompanying batteries**, to advance to the close support of the infantry attack. This may or may not involve actual movement forward, but refers rather to accompaniment by fire.

The Use of Supports (Dragmen)

12–259. After the guns are in position, the dragmen constitute the supports, and are deployed or held under cover in order to minimize losses, but near enough so that they can be readily called on to shift the position of the pieces or to support them against an infantry attack, especially a flank attack. Where there is no probability of such a situation arising, they may be formed into infantry companies and added to the firing line. But it must be borne in mind that the artillery thereby becomes practically immobile, and in the event of an unexpected change in the tactical situation, requiring the advance of the guns to attack a new target, or their retirement to avoid capture, neither situation can be taken advantage of. Moreover, they become especially vulnerable, as there are now no men available for their support, or even for the replacement of casualties.

It is better to consider the artillery supports as a part of the infantry reserve, to be detached only in extreme cases; but since such cases are precisely the ones most likely to require the presence of the artillery supports at the pieces, the decision for such detachment should be made only after a careful consideration of the tactical situation, with an eye to eventualities. (See art. 19–228 et seq.)

Choice of Position

12–260. The area within which the field artillery must take position depends on the plan of action decided on by the commander of troops.

The choice of position must be such as to make the best use of the terrain within these limits.

12–261. The only invariable rule in the choice of a position is to post the guns as to be able to carry out effectively the task assigned them.

Important consideration in the choice of a position are:

(1) Obtaining an effective range.
(2) Securing a large field of fire.
(3) Concealment from view.
(4) Facility of movement to the front, flanks, and rear.
(5) Proximity of good locations for observing stations.
(6) Favorable conditions for resupply of ammunition.

Positions combining all of the above qualifications are seldom or never found. The choice as to which consideration carries most weight depends upon the tactical situation.

By a suitable choice of positions and of observing stations the greater part of the terrain within range of the guns may be included within the field of fire and the dead space reduced to a minimum.

12–262. When not incompatible with the effectual accomplishment of the duty to be performed, concealment from view is always to be sought. This is true whether direct or indirect laying is employed. By rendering the guns inconspicuous or entirely concealing them their sustained service may be counted upon, while the difficulties of the enemy in locating his targets and adjusting his fire are increased.

12–263. The principal means of concealment is the defilade of the guns from all points within the enemy's position. Complete concealment requires the flashes of the guns to be invisible from the enemy's position. Such concealment requires in daylight a defilade of about 12 feet.

12–264. In the selection of a position it is necessary to determine the defilade which can be secured while keeping the trajectory, at the shortest range to be used, above the mask affording the concealment.

12–265. When direct laying is to be used, the necessity for seeing the target through the sights fixes the position to one very near the line from the mask to the target. Similarly, little concealment is possible when very short ranges must be used.

12–266. Positions which, from the enemy's point of view, are on the sky line are usually the most conspicuous. By placing the guns below the sky line, so that they will have a favorable background, and by preventing movements of the personnel, a battery may be unrecognized, even though it is in the open. It is important, however, to have a crest, a hedge, or a clump of trees in front

so as to increase the enemy's difficulty of observation and of exact location. In the absence of natural cover artificial means may be used to conceal the guns as, for example, by tying branches of trees to the wheels, etc., and thus breaking the outline.

A position in rear of a crest, with a parallel crest of about the same height in front and some distance away, offers many advantages. The enemy is apt to mistake the crest nearest him for the one actually occupied and to consider shots falling between the crests as beyond his target. The trees, a hedge, standing grain, etc., 400 or 500 yards in front of the guns, and so that the line of sight just passes over them, may similarly serve to deceive the enemy as to the actual position.

When indirect laying is to be employed, a position on a gentle slope just far enough behind the crest to insure the concealment of the flashes best facilitates running the guns up to the crest should direct laying be called for. If the position is discovered by the enemy, however, and the crest is plainly seen by him, the guns are in a very vulnerable position, as shrapnel may be employed to search such a reverse slope very effectively.

The most advantageous position, from the point of view of concealment alone, is one more than 400 yards in rear of a covering mask, having flash defilade and hidden from the view of any auxiliary observers whom the enemy may push to the front and flanks.

A position on the counter slope is frequently advantageous in reducing dead spaces, facilitating ammunition supply, and securing suitable observation stations near the guns.

12–267. Protection from observation by aircraft is obtained by posting the guns under trees, by placing brush or small trees around the guns, by providing an overhead screen of the same color as the surrounding terrain, and by any means of breaking the outlines of the matériel. Complete immobility on the part of all the personnel during the time that hostile aircraft are in observation is also an important means of avoiding notice.

12–268. Firing over friendly troops.—Firing over our own troops is to be regarded as a normal procedure.

Freedom is thus gained to post artillery so as to cover effectively the whole front of the combat and to realize the power of concentrating the fire of widely separated lines.

Projectiles should clear friendly troops by at least 10 yards. Fire over them should not be conducted with elevations of less than 1,000 yards, or when they are within 400 yards of the guns. These limitations are modified by the relation between positions occupied by the target, the friendly troops, and the guns

Reconnaissance

12–269. The duty of locating the enemy and of securing information concerning him devolves in general upon troops of the other arms.

The artillery must, however, obtain for itself such special information as is needed to insure the proper posting and the effective employment of the guns to carry out the tasks assigned it.

At the earliest opportunity the officer commanding the artillery reconnoiters and selects the positions for the artillery in accordance with the instructions which he has received and the tactical requirements of the situation. He causes his immediate subordinate commanders to accompany him or informs them when and where they are to report to receive their instructions.

12–270. When a commander goes forward for reconnaissance he instructs the officer left in command on the following points, so far as may be desirable and practicable: (1) The tactical situation; (2) whether or not the command is to follow at once; (3) the time and place for subdivision, if such subdivision is to be made; (4) the route to be followed; (5) the rate of march. Additional instructions may be transmitted from time to time by markers, who should be left at places where uncertainty as to the route may arise or where difficulties are to be avoided. As soon as the position and the best method of approaching it have been determined upon, agents or scouts may be sent to meet battalions or companies and guide them by the most favorable routes to their respective positions.

12–271. In undertaking a reconnaissance an artillery commander should have a clear idea in his mind of the general plan of action and of the task to be accomplished by the force under his command. Unembarrassed by details, he should study the tactical situation and the lay of the ground, select the position

with a view of carrying out his special mission, and arrange for the necessary preparatory dispositions. The details of securing information, etc., should be performed by reconnaissance officers and scouts.

12–272. An artillery reconnaissance officer may be attached to advanced troops, and if so he should, as soon as possible after the determination of the enemy's location, submit to the artillery commander a report giving all obtainable information as to the enemy and describing the most suitable position of our own artillery. This report should be accompanied by a sketch, showing the enemy's position, the position selected for our own artillery, the characteristics of the country intervening between the two, and such other important information as may be readily set forth. The report should embrace information such as the following relative to the position selected: (*a*) The various routes of approach and their relative practicability, stating difficulties, if any; (*b*) possibility of approach under cover; (*c*) whether direct or indirect laying is recommended; (*d*) cover afforded for guns; (*e*) need of providing artificial cover; (*f*) number of guns which may be posted advantageously in the position; (*g*) facility for resupply of ammunition; (*h*) in case indirect laying is recommended, possibility of securing good aiming points and good observing stations and of firing over intervening obstacles.

As to the enemy, the report should include information as to: (*a*) The most important and immediate targets; (*b*) location and strength of the various hostile bodies; (*c*) location or probable location of the hostile artillery.

Advance to and Occupation of the Position

12–273. Artillery commanders habitually precede their commands to the position to be occupied.

Before the arrival of his guns, each c. c. should have determined exactly where they are to be posted. Ordinarily he remains in observation of the terrain and targets assigned him, and sends his c. p. o. back with exact instructions to the senior pt. c., as to the position to be occupied, the route to be followed, etc. If necessary, however, he meets his company at a short distance in the rear, and personally conducts it to its position.

12–274. Reconnoitering parties, scouts, and other members of the headquarters detachment must operate so as to avoid indicating the position which is to be occupied. If exposure is necessary, it should not occur in the neighborhood of the chosen position. If the occupation of the position will be visible to the enemy, delay in establishing the guns may be fatal. In such cases it may be preferable to advance boldly to the position from which they can open fire immediately.

When the circumstances permit, it is always preferable to unlimber under cover. If direct laying is to be employed, the guns are run up by hand, after unlimbering, until each pointer can just see his target through the sights. By requiring all individuals to keep under cover and by avoiding all movements on the crest, a position may readily be occupied without the knowledge of the enemy, securing the advantage of surprise as well as safety.

12–275. If positions are to be occupied at night, the route and all the details of the movement must be determined in advance by reconnaissance during the day. It is usually desirable to post markers along the route to be followed before nightfall. Such markers must be at close intervals.

Immediately after establishing the guns in position, communications are opened up with the observation station. Observers should also be posted to provide security against close attack.

12–276. As soon as possible after occupation, the preparation of artificial cover against fire and observation is begun. The first cover provided should be constructed with a view of its being developed into complete protection as the occupation of the position continues. Similarly, advantage should be taken of any lull in the action to complete the cover. If the dust from the discharge of the pieces rises so as to reveal the location of the guns, it may be reduced by wetting the ground, or covering it with wet branches, or other noninflammable material. The plan to be followed depends on circumstances.

(For intrenchments see art. 22–37.)

Changes of Position

12–277. If guns are rendering effective service, changes of position in the midst of an engagement should be made only when some very distinct advantage will thereby be gained. Changes involve interruption of fire, necessitate

dismantling and reestablishing communication, a fresh orientation of the command and a new adjustment, and, if made in the view of a vigorous enemy, are apt to result in paralyzing losses.

Nevertheless, as an action develops changes of position may be essential. Artillery commanders must anticipate and prepare for such movements. Reconnaissance officers and scouts must be employed to reconnoiter and select routes, to remove obstacles, to perform such pioneer work as may be needed, and to prepare themselves to guide organizations over the routes selected.

12–278. If a hasty movement is imperatively demanded, great losses may be avoided by skillfully using the cover afforded by the ground, and by moving rapidly over spaces where exposure is inevitable. If the guns are under effective fire of the enemy's infantry or artillery, changes of position are apt to involve heavy losses, if the guns are in sight of the enemy. If the drag can be manned under cover, the losses due to the close order formation may not be great, as the movement can be rapidly executed. But if animal transportation is used, it is best to wait for a lull in the firing.

12–279. Changes of position are usually in echelon, in order to keep up the fire and cover the movement of the unit which is changing position. For a single artillery company, however, the change is usually made simultaneously, unless it is necessary to cross a fire-swept zone.

12–280. A change of position by certain batteries may be necessitated by the fact that the enemy has succeeded in locating them and in securing the ascendancy of fire. A short movement by hand during a lull in the fire may be sufficient in such cases.

Section XII.—COMBAT

With the Advance Guard

12–281. The action of field artillery with an advance guard will vary with the mission. It should not occupy positions from which it can not be withdrawn without a general engagement, perhaps not intended by the commander of the force. Its main duties are to break down any resistance to the advance of the other arms or to cover their retirement if necessary.

Positions with as much cover as possible should be chosen, with preservation of complete freedom of maneuver, while the guns themselves should be placed at wide intervals, and used with great rapidity of fire, so as to deceive the enemy, if possible, as to the strength of the force opposed to him.

Some means of transport other than man power is imperative, if artillery is to be attached to the advance guard; otherwise its lack of mobility prevents fulfillment of its mission.

The Attack

12–282. In general, when large forces are engaged, the attack presents three principal phases:

(1) The preparation.
(2) The decisive action.
(3) Securing the victory, or averting disaster in case of failure.

The use of artillery in the attack will vary in conformity with these different phases. (See art. 19–126 et seq.)

12–283. In the preparatory stage artillery has for its objectives those parts of the enemy's force which at the time most oppose the action of our infantry. Until our infantry comes within effective small-arms fire the principal target will therefore be the hostile artillery. As the progressive advance of our infantry brings them within effective rifle fire, more attention must be paid to the hostile infantry.

Obstacles such as walls and abatis, which impede the advance of our infantry should, if possible, be destroyed by artillery fire.

12–284. The counterbatteries acting from masked positions must dominate the enemy's artillery; the infantry or breaching batteries open upon the hostile infantry and obstacles.

12–285. The artillery preparation for the infantry attack is in general carried on simultaneously with the infantry advance. If, however, the enemy has fully occupied his position, or the attack is able to form under cover close to the hostile position, and thus has only a short distance to advance, the preparation may take place both before and during the attack.

During this special preparation the counterbatteries continue or resume their fire on the hostile artillery.

12–286. In the decisive attack a special preparation is necessary. The most rapid and intense concentration of fire of all the available artillery is brought to bear upon the objective against which the infantry is to advance.

12–287. As our attacking infantry reaches the danger zone of our artillery the commander of the infantry firing line should, by a preconcerted signal—such as the display at the firing line of a conspicuous and suitable flag—inform the artillery commander of the fact. The artillery then increases its range, so as to impede the movement forward of possible hostile reserves and to take the enemy in the rear in case he retreats.

12–288. When the third phase of the attack is reached, accompanying batteries will be designated from the infantry batteries whose mission will be to reach the captured position as soon as possible after the infantry, in order to pursue with their fire the retreating enemy and to aid in repulsing any counter attack.

12–289. In case of reverse, artillery directs upon the enemy's attacking troops every gun which can be brought to bear, in order to destroy their morale and to assist the repulsed troops in the renewed effort which may lead to victory. If the repulsed troops continue to be forced back, the artillery must cover their withdrawal.

The Defense

12–290. The defense requires, before all things, skillful utilization of the available ground in order to develop fire effect to the utmost.

Exhaustive preliminary reconnaissance of the position, improvement of communications within it, determination of the ranges, especially of those to probable artillery positions of the enemy and to points in the probable direction of the infantry attack, are advantages which the defense must utilize so far as time permits.

In preparing positions which may be occupied a most extensive use is to be made of earth cover. If time permits, it is advisable to provide masks and to improve the field of fire by cutting down hedges and trees. It is of the greatest importance to place a large supply of ammunition in readiness in the immediate vicinity of the guns.

As soon as the general direction of the enemy's attack is recognized, but if possible before the enemy brings his batteries into action, the fighting position is occupied. Sometimes flanking artillery fire can be employed with advantage to search dead angles before the fighting position.

12–291. The commander of the troops will usually order the opening of fire. Firing at excessive ranges and upon small hostile detachments is to be avoided, for this assists the enemy in locating the guns.

When the enemy's infantry advances to the attack, the artillery must make them their target regardless of the enemy's artillery fire, if necessary leaving cover for this purpose. If possible, the enemy's batteries should at the same time be held in check, but the repulse of the infantry attack must remain the most important feature.

If, even before the infantry attack commences, the enemy's artillery proves itself so superior that it appears hopeless to continue the artillery action, the batteries may temporarily seek cover from the enemy's fire. But as soon as the enemy institutes the decisive attack every gun must at once resume the struggle and engage the enemy's infantry only, heedless of the artillery fire.

12–292. If, nevertheless, the attack succeeds, part of the artillery must prevent the advance of hostile batteries into the captured position, part must concentrate its fire upon the hostile infantry which has penetrated, and, in cooperation with the reserves, expel the enemy from the captured position. This is one of the tactical situations in which steadfast endurance to the last is imperative.

With the Rear Guard

12–293. As the principal duty of a rear guard is to gain time, and as it should be able to withdraw without serious loss, it should be strong in field artillery. Positions should be selected so as to utilize the long range of the guns to force the enemy to deploy at the greatest possible distance; such positions must also afford sufficient facilities for withdrawing. In withdrawing, small changes of position should be avoided, the retirements from one position to another being over as great a distance as is consistent with delaying the enemy to the utmost.

As with the advanced guard, some means of motor or animal transport is imperative, or the artillery can not fulfill its mission.

Chapter 13

MACHINE GUNS

Section I.—GENERAL PRINCIPLES

13–1. Machine guns may be consolidated and the personnel organized into machine gun companies and battalions, or may be separated and assigned to designated infantry and artillery companies. The former method permits greater coordination of effort, especially in major operations; the latter permits greater flexibility, especially in minor operations against poorly organized enemies, and will, under normal circumstances, be that employed in landing forces from the fleet.

13–2. Whichever method of organization be adopted, the machine-gun crews must be carefully chosen, and must be thoroughly familiar with the type of gun assigned to them, including the clearing of jams. The efficient handling of a machine gun under the varying conditions of service requires a high order of technical skill and dexterity, which can only be acquired by long practice with that type of gun. A lack of this experience leads to frequent interruptions in the fire, or total inability to function, possibly at critical moments, in addition to inefficient handling of the sheaf of fire. For this reason, machine guns should be permanently assigned.

13–3. When practicable, two machine guns are provided for each infantry company, and a similar number may be attached to each artillery company. These guns should always work in pairs, or within supporting distance of each other. Guns of different types should never be paired.

13–4. Unless specially equipped, ships of the fleet are not supplied with a sufficient number of machine guns to provide two for each company of the complete landing force. Such guns as are available are issued to designated companies, and when necessary others are obtained from ships that do not land.

Types of Guns

(Ordnance pamphlets 404, 405, 405A, Browning; 406, Lewis; 430, Colt)

13–5. At present the following types of machine guns are in use in the naval service:

Heavy type.—Vickers, Browning heavy, Colt, and Marlin. These are fitted with carriage or tripod, and feed from a belt. The Vickers and Browning heavy are water cooled.

Light type.—Lewis, Benet Mercie, and Browning light. These have magazine feed and are air cooled. The Lewis, due to its weight, is intermediate between the light and heavy type, and due to its method of cooling is capable of more prolonged fire than other air-cooled guns. The Benet Mercie and Browning light are also classed as "machine rifles."

13–6. The heavy type has greater steadiness, due to its greater weight and form of mount, which gives it greater accuracy, especially at the longer ranges. It is especially suited for long range covering fire. However, none of the above types, except those that are water cooled, is capable of prolonged continuous fire.

13–7. The light type has greater mobility and handiness. It can be easily carried considerable distances, and can be put into action very quickly. It is especially suited for close support of the infantry, either in attack or defense, and may be used to advantage with the advance party or even with the point of an advance guard, or near the line of observation of outposts; and its position may readily be shifted to suit tactical requirements. The heavy type may also be used in the same manner, though with greater effort.

Transport

13–8. Every effort should be made to commandeer proper cart, or pack-mule transportation, for machine guns and their ammunition. Unless carriages are provided for the "heavy type" guns, the gun squad can transport them only short distances without the aid of special carriers. When carried by hand they are best transported slung on light poles.

The "light type" guns with their ammunition can be transported satisfactorily by the gun squad, but if the distance be long, only about 1,200 rounds of ammunition can be carried with each gun.

13–9. Where machine-gun carts, Marine Corps type, (Cole cart) are furnished or can be obtained, the guns, with spare parts, tool kits, and ammunition supply complete, can be much more satisfactorily handled and transported. Two carts are provided for each squad. They are light, have great mobility, and will transport the gun and as much ammunition as a pack mule is able to carry, with no increase in personnel.

13–10. The machine-gun squad, when forced to carry the gun and equipment, does so in the most convenient manner, dividing the load as much as possible, and shifting the different loads from one to another.

Organization

13–11. A single machine gun, whatever the type, requires about one squad for transporting the gun, its equipment, spare parts, and ammunition. The squad is therefore the smallest unit of machine-gun organization.

13–12. The machine-gun squad (Lewis gun) consists of the squad leader (a 2. p. o.) and seven men, as in an infantry squad. The front rank retains the numbers 1, 2, 3, 4; the rear rank is renumbered 5, 6, 7, and 8, respectively. The squad leader becomes **gun captain.** Nos. 1, 2, and 3 constitute the gun crew, and become, respectively, the **pointer, first loader,** and **second loader.** Nos. 5, 6, 7, and 8 constitute the support, and assist in transporting the gun and its equipment, spare parts, ammunition, etc., according to the type of gun and the equipment supplied, and in providing ammunition in action.

When the Lewis gun is transported by the Cole cart, two additional men are generally provided although eight men can handle the carts under usual circumstances. (See Sec. III.)

The machine-gun squad (Browning heavy): The gun squad, less transportation, consists of 1 petty officer and 10 seamen with the squad gun equipment. The petty officer commands the squad, No. 1 is the gunner, No. 2 the loader and assistant gunner, and Nos. 3, 4, 5, 6, 7, and 8 are ammunition and water carriers. Nos. 9 and 10 (mule leaders) act as ammunition carriers and replacements during gun drill.

Each man is given a permanent number in the gun squad. When any number is absent, or becomes a casualty, each higher number takes the place of the next lower number.

13–13. Machine-gun companies, etc., have an organization similar to that of corresponding infantry units. Thus the machine-gun **platoon** consists of not less than two nor more than four machine-gun squads; and the machine-gun **company** of not less than two nor more than four platoons.

At least three officers are necessary for each machine-gun company and, if practicable, there should be, in addition to the company commander, a junior officer for each platoon.

13–14. When machine-gun squads are attached to infantry companies, their post in line is 5 paces in rear of the line of file closers; in column, 2 paces in rear of the rear guide. They take no part in infantry drills as machine-gun units.

13–15. Machine-gun companies and other separate detachments are posted as prescribed in article 4–4.

13–16. When present at ceremonies, machine-gun companies participate in the same manner as artillery companies, so far as is consistent with the nature of their equipment. Machine-gun squads attached to infantry companies are normally either temporarily combined into machine-gun detachments or become infantry squads of their own companies.

General Rules

13–17. The movements, signals, formations, and general rules for infantry apply to machine-gun units, so far as is consistent with the nature of their equipment, and except where otherwise provided or obviously inappropriate.

13–18. When machine-gun squads are attached to infantry or artillery companies, they will conform to the spirit of such command as may be given for the company, without awaiting the specific commands applicable only to machine-gun units.

Formations

13–19. In the formation **squad to the front,** whatever the type of gun, the squad is formed as an infantry squad, facing to the front, 1 pace to the right of the gun, where there is no cart or carriage; or 1 pace to the right of the drag ropes or leading cart pole, as the case may be. This formation is similar to **platoon to the front,** in artillery.

13–20. The **marching formation** depends on the type of gun. The gun, tripod, etc., if carried by the squad, are laid on the ground in the most convenient manner when at a halt.

13–21. For the formation **in battery,** the gun, mounted and cleared for action, is pointed in the designated direction; the gun captain takes post near the gun ready to supervise its fire; No. 1 is at the shoulder piece; Nos. 2 and 3 in position for performing their duties, according to the type of gun; the other members of the squad have stations as directed. All take cover, so far as practicable. The gun carts, if provided, are in designated locations, under cover if practicable.

13–22. The above formations apply to the squad, whether attached to infantry and artillery companies or part of machine-gun companies.

The distance and interval between successive guns, when in the **marching formation** or **squads to the front,** is as may be appropriate for the type of gun and equipment supplied. When **in battery,** the interval is as directed in the order for taking that formation.

13–23. Gun and battery drills.—*a.* In drill with the gun, two objects must be kept in mind:

(1) To develop accuracy and speed in handling the gun.

(2) To develop discipline, which is the most essential part of the seaman's training.

b. Thorough training of the individual is the basis of efficiency. Members of the gun squad must be taught to perform quickly and accurately the individual duties required of them in handling the gun. They must acquire such a thorough knowledge of these duties and, in addition, possess such a thoroughly grounded habit of performing them properly, that the handling of the gun is not affected by the excitement of action. This habit of implicit obedience of orders and accurate performance of duties is indispensable in extended order exercises and combat practice.

c. The gun squad must be trained as a unit so that its individual members work together smoothly, quickly, and effectively. When the squads become proficient in the various gun drills and when teamwork has been developed, instruction is given at night, or with the men blindfolded, to accustom them to handling the gun by touch rather than by sight. The best men are selected as gunners. Every man in the squad is thoroughly trained in the duties of every other man in order that the service of the gun will not be affected by casualties.

d. To secure the objects set forth in subparagraph *a,* all movements are executed at attention unless otherwise ordered. Men not participating in the movement execute **stand at ease** or **at ease** as ordered by the instructor.

e. Cart drill consists of drill by the squad, platoon, and company, with the appropriate transportation. The objects of cart drill are—

(1) To instruct the men to drill, maneuver, and march with the carts.

(2) To secure uniform methods of executing the various movements.

(3) To instruct the men in the proper methods of handling the animals, if provided.

13–24. Training in the supply of ammunition, water, oil, and spare parts.—*a.* Adequate and uninterrupted supply of ammunition, water, oil, and spare parts being essential to the successful employment of the machine gun in combat, training in supply must not be neglected. The squad is first instructed in the operation of the belt-filling machine, establishment and operation of a munitions distributing point, and the functioning of the chain of supply. This

instruction having been given, provision for and maintenance of supply is combined with other drills or exercises. Training in supply includes—

(1) *Establishment and operation of a munitions distributing point.*

(*a*) Receipt and storage of ammunition, water, oil, and spare parts.

(*b*) Sorting, cleaning, and filling empty ammunition belts by hand and with the belt-filling machine. Loading of belts with ball or designated proportions of ball, tracer, and armor-piercing ammunition.

(*c*) Packing loaded belts into empty ammunition boxes.

(*d*) Segregation and storage of filled ammunition and water boxes for issuance to carriers as required.

(2) *Operation of the chain of supply.*—The gun being mounted and a munitions distributing point having been established, the instructor directs the squad to practice the operation of the chain of supply. The following methods are given as a guide:

(*a*) When the exercise is started, No. 4 brings ammunition to the position of No. 3, secures empty ammunition boxes and belts, and returns to the munitions distributing point for a new supply. Each succeeding number delivers his load as required to the position of No. 3 in a similar manner, and returns to the munitions distributing point for a new supply. As each number secures a new load, he again approaches the position of No. 3, following the man who has preceded him from the munitions distributing point. When the required supply is at the position of No. 3, all carriers take available cover.

(*b*) If the distance to be covered is very short, or if it is difficult for men to pass each other en route, as along a ditch leading to the gun position, boxes may be passed from hand to hand.

(*c*) If the supply is to be maintained across an open space for a short distance, the supply may sometimes be kept up by dragging boxes which have been attached to the emergency rope. One end of the rope being at the gun position, No. 3 makes a loop in the center of the rope and passes it through the handle of an ammunition box, securing it with a stick. No. 2 then pulls the full box to the gun, attaches an empty, and No. 3, pulls it back.

To Prepare for Action

(For the machine-gun in action see Combat Principles of the Machine Gun, Part III)

13–25. The command is: 1. **Action front** (**right, left, rear**), 2. **MARCH**, in the same manner as for artillery, and may be used for individual guns or larger units. When the machine guns are mounted on carriages, or where otherwise appropriate, as for example when they are attached to an artillery company, the commands **in battery, in battery action front** (**right, rear, left**), etc., may also be used. When attached to infantry companies, machine guns will prepare for action, on command of the squad leader, immediately on arriving at the position designated by the c. c. as the one to be occupied.

To Prepare for the March

13–26. Being **in battery**, each squad takes the **marching formation** at the command **PREPARE FOR TRANSPORT**. Where appropriate, the command **MAN THE DRAG** may also be used, as for artillery. Each squad having taken the marching formation, the squads are assembled by appropriate commands, as for a line of infantry squads in extended order. If attached to infantry companies, machine gun squads **prepare for transport** at the order to assemble given to the company as a whole, after which they assemble as indicated.

13–27. In an attack, to advance the guns or to advance by rushes, the sights are laid down at the preparatory command for the advance. The gun is set at safety (for Marlin, Colt, or similar type guns, cartridges must be withdrawn from the chamber). The pointer and first loader on either side pick up the gun and tripod without dismounting it, and carry it as directed. Other members of the squad follow with ammunition, etc.

To Take Position

13–28. Infantry commands are used when appropriate. The following additional commands may be used: 1. **Line of squads**, 2. **on first (or other) squad**, 3. **Interval, 50 (or so many) yards**, 4. **MARCH**.

1. **Form echelon**, 2. **on first (or other) squad**, 3. **To the left (right) rear (front)**, 4. **Interval (so and so)**, 5. **Distance (so and so)**, 6. **MARCH**.

Section II.—THE COLE CART

General

13–29. The Cole cart for machine guns was invented by Maj. Edward B. Cole, U. S. M. C., who was killed overseas while commanding a machine-gun battalion. The cart is now designed for six different uses: (1) Machine-gun; (2) Machine-gun ammunition; (3) 37-millimeter gun; (4) 37-millimeter gun ammunition; (5) 3-inch trench mortar; (6) 3-inch trench-mortar ammunition. The Cole cart has been tested and found capable of carrying 1,000 pounds without danger of collapse. Deducting from this figure to allow for possible severity of usage in the field, there is absolute safety in designating the maximum load as 600 pounds. When the cart is in use an effort should be made to balance the load so that very little weight is carried by the men holding up the tongue of the cart. Originally the cart was equipped with bicycle wheels, but these are now replaced with motor cycle wire wheels with 28 by 3 pneumatic tires. The Cole cart in the field may be used very conveniently to transport men's packs, headquarters gear, signal equipment, ammunition, etc.

The Squad

13–30. General rules.—*a.* "Cart" unless otherwise indicated, refers to the Cole cart, men at drags, and men following in trace. The 37-millimeter gun, on wheels, with sponge staff through the lunette swivels, is considered to be a cart.

b. "Squad" refers both to men of the squad and to the carts handled by them.

c. "Drags" are the horizontal handles at right angles to the tubular shaft which projects from underneath the cart. In the case of the 37-millimeter gun, "drags" applies to the sponge staff in position through the lunette swivels.

d. Men following in trace (the rear rank) march at 48 inches distance from the cart hubs. This places them about 100 inches from the backs of their file leaders. Distance is measured from the hubs because drag-to-rear measurements of carts are not uniform.

e. Drags are always grasped with the backs of the hands uppermost, thumbs around and under the drags.

f. Rear-rank men assist the execution of movements whenever necessary by lifting the carts into position from the rear.

g. The squad executes **EYES RIGHT** or **LEFT**, the **HALT, FORWARD** and **BACKWARD MARCH**, the **HALF STEP, DOUBLE TIME** and **QUICK TIME, AT EASE, REST, FALL IN,** and **FALL OUT,** and **PRESERVE ALIGNMENT** in accordance with the principles prescribed for the rifle squad.

13–31. Organization.—*a.* The machine-gun squad consists of a petty officer and 10 men. The men should be armed with the service pistol. If, however, it is impracticable to arm them with the pistol, the rifle should be carried slung as prescribed for artillery units (arts. 12–20).

b. The machine-gun squad leader, when his squad is part of a larger organization, is posted in the line of the file closers in rear of the right file of the squad. When the squad consists of a petty officer and less than 8 men, or when a closer semblance to rifle organization is desired, the petty officer may be posted at the left drag of the left cart of the squad. The petty officer of the 3-inch trench mortar, or 37-millimeter gun squad, is always posted at the left drag of the left cart of his squad.

c. Files are left blank in accordance with the principles prescribed in chapter 3.

13–32. To form the squad.—*a.* The petty officer places himself 3 paces in front of where the center of the squad is to be and commands: **FALL IN.** The squad assembles with its carts aligned, gun cart on the right in the case of gun squads, 2 front-rank men at the drags of each cart, 4 inches interval between elbows in each rank. Front and rear ranks align themselves to the right. The rear rank men cover their file leaders. File closers form at 2 paces distance from

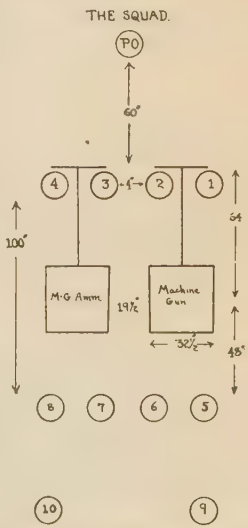


FIG. 179.—To form the squad

the rear rank. Numbers 9 and 10 of the machine-gun squad form in the line of file closers. The petty officer then commands: 1. **Number**, 2. **OFF**. At this command men count in accordance with the prescribed principles for their particular squad. Drags are then grounded and pistols are inspected. (See fig. 179.)

13–33. To ground drags.—The squad being in any formation, the command is: 1. **Ground**, 2. **DRAGS**. At this command men at drags place the drags drags on the ground at their feet and resume their former position.

To man the drags.—The squad being in any formation with drags grounded, the command is: 1. **Man**, 2. **DRAGS**. At this command front-rank men stoop and grasp the drags of their cart and resume their former position, drags in hand.

13–34. To align the squad.—The base file or files having been established, the command is: 1. **Right (left)**, 2. **DRESS**, 3. **FRONT**. At the command **DRESS** each man except the base file executes **eyes right** and placed himself so that his eyes and shoulders are in line with those on his right and so that his right elbow is 4 inches from the left elbow of the man on his right. This interval is judged solely by eye and alignment is verified (arts. 3–6). At the command **FRONT**, each man turns his head and eyes to the front.

13–35. To open and close ranks.—Executed by the same commands and as prescribed for the rifle squad (arts. 3–7), except that in closing ranks, rear-rank men close to 48 inches distance from the cart hubs instead of 40 inches distance from their file leaders.

13–36. Stand at ease.—The command is: 1. **Stand at**, 2. **EASE**. At the command **EASE** men at drags stand fast. Men not at drags execute the command in accordance with articles 2–4(*e*).

13–37. Parade rest.—The command is: 1. **Parade**, 2. **REST**. At the command **REST** men at drags move the right foot 6 inches straight to the rear, left knee slightly bent, weight of the body resting equally on both feet, and drop the drags to the full extent of their arms. Men not at drags execute the command as prescribed in articles 2–4(*f*).

13–38. Present arms.—The command is: 1. **Present**, 2. **ARMS**. At the command **ARMS** men at drags stand fast. Men not at drags execute the hand salute.

13–39. The oblique march.—*a*. The squad being in any formation the command is: 1. **Right (left) oblique**, 2. **MARCH**. At the command **MARCH**, carts swing 45 degrees to the right in marching and continue in the new direction. Carts retain their relative positions, no attempt being made to bring the left cart abreast of the right cart.

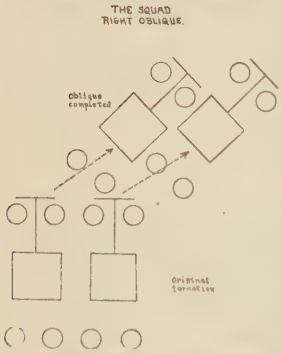


FIG. 180.—The squad. Right oblique

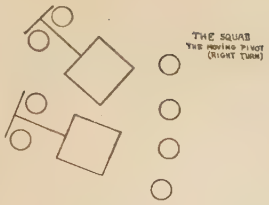
b. To resume the original direction the command is: 1. **Forward**, 2. **MARCH**. At the command **MARCH** carts swing 45 degrees to the left and resume their original direction or march.

c. The command **HALT** is not given during the oblique.

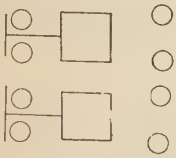
d. If at **Half step** or **Mark time** while obliquing, the oblique march is resumed by the command: 1. **Oblique**, 2. **MARCH**. (Fig. 180.)

13–40. To turn on a moving pivot.—*a*. The squad being in line, the command is: 1. **Right (left) turn**, 2. **MARCH**. At the command **MARCH** No. 1 at the drag of the right cart moves as prescribed in chapter 3, allowing the cart to follow as it will. No. 2 at the left drag of the right cart, conforms to the movement of the cart as guided by No. 1. The left cart of the squad moves straight to the front one step, obliques to the right until opposite its place in line, again obliques to the right, and picks up the half step when it arrives abreast of the right cart. On the eleventh count after the command **MARCH** all step off with the full step. (Fig. 181.)

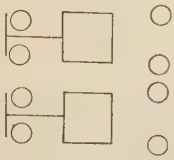
b. **Right (left) half turn** is executed in a similar manner except that the change of direction is 45 degrees and the left cart makes but one oblique.



Second count: No. 1 has faced in marching and has taken one full step in the new direction. No. 2 front rank is conforming the movement of the cart as guided by No. 1. The left cart has obliqued slightly. The rear rank is following the movement of the carts.

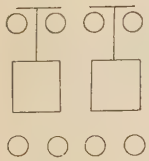


First count after command **MARCH**: Squad has taken one additional step.

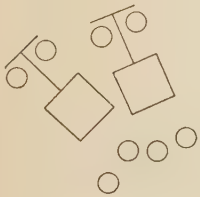


At the command **MARCH**

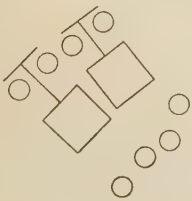
FIG. 181.—The squad. Moving pivot (Right turn)



The tenth count: The right cart has become fully faced in the new direction during the eight half steps. On the eleventh count (after the command **MARCH**) all step off with the full step.



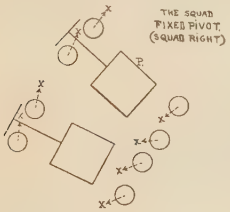
Fourth count: No. 1 front rank has taken another half step (he takes eight in all). The left cart, still at the oblique, has gained more on the right cart. The left cart is now about in rear of its place in line and will initiate another oblique on the next step.



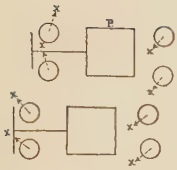
Third count. No. 1 front rank has taken one half step. The left cart is now in full oblique and has gained 15 inches on the right cart.

FIG. 182.—Right turn. (Concluded from fig. 181)

13–41. To turn on a fixed pivot.—*a. The squad being in line, to turn on a fixed pivot and march,* the command is: 1. **Squad right (left)**, 2. **MARCH.** At the command **MARCH** the right cart takes two steps straight to the front, stopping the forward motion of the cart on the second of these two steps. The cart then, in three counts, swings 90 degrees to the right on its right wheel and steps off in the new direction on the sixth count. The left cart takes two 36-inch steps to the front, changes direction by swinging the cart to the right in three counts, and steps off with the right cart on the sixth count.

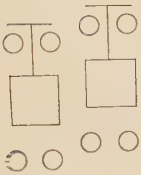


Third count: Each man has moved to position indicated by crosses in diagram of second count. The left cart has started its oblique. The right cart is pivoting on its right wheel ("P"). Crosses indicate where each man is to step on the next count.



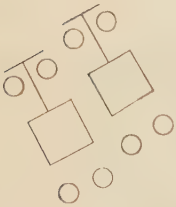
Second count: Since the command **MARCH** the squad has advanced two steps straight to the front, the left cart increasing the length of its step to 36 inches. The front rank of the right cart has stopped the forward momentum of the cart. Crosses show direction of next step. The right wheel of the right cart (marked "P") is the pivot.

FIG. 183.—The squad—Fixed pivot, squad right



FIXED PIVOT

Fifth count (squad right): The turn is completed and the right cart is ready to step off with the full step on the next count. Although the left cart is slightly in rear of its place in line, it is sufficiently close (within 6 inches) to enable it to come abreast of the right cart on the next step. The left cart will take a 36-inch step, if necessary, and then take up the full step.

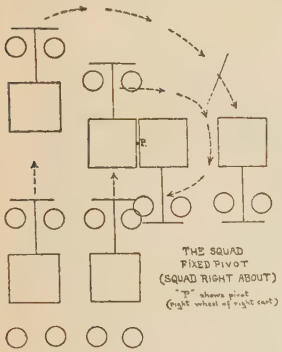


Fourth count: The right cart will be completely faced in the new direction on the next count, ready to step off. The left cart will also complete its turn on the next count but will be slightly in rear of the proper position abreast of the right cart.

FIG. 184.—Fixed pivot, squad right (concluded from fig. 183)

b. The squad being in line, to turn on a fixed pivot and halt, the command is: 1. **Squad right (left)**, 2. **MARCH**, 3. **Squad**, 4. **HALT.** The third command is given immediately after the command **MARCH.** The turn is executed as prescribed in the preceding paragraph except that the carts upon arriving on the new line mark time until the command **HALT** is given, when all halt. The command **HALT** is not given before the fourth count.

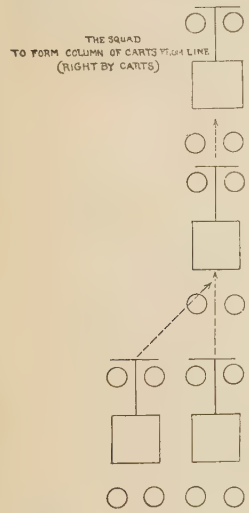
c. The squad being in line, to turn about and march, the command is: 1. **Squad right (left) about**, 2. **MARCH**. At the command **MARCH** the right cart takes four steps straight to the front stopping the forward momentum of the cart on the fourth of these steps, swings to the right about on its right wheel in six counts, and steps off in the new direction on the eleventh count. The left cart takes four steps straight to the front, moves around the right cart in a series of obliques, and places itself abreast of the right cart in time to step off with the right cart on the eleventh count. (Fig. 185.)



The squad takes four additional steps straight to the front, the left cart increasing the length of its stride, then swings as in the third, fourth, and fifth counts of "Squad right," swings again in similar manner, and steps off with the full step on the eleventh count. If the cart does not arrive abreast of the right cart on the tenth count it continues at increased stride until in its place. If the command **HALT** is to be given it is not enunciated until the left cart has arrived abreast of the right cart.

FIG. 185.—Fixed pivot (squad right about)

d. The squad being in line, to turn about and halt, the command is: 1. **Squad right (left) about**, 2. **MARCH**, 3. **Squad**, 4. **HALT**. The third command is given after the second command and before the eighth count. The turn is executed as prescribed in the preceding paragraph except that all men, on arriving on the new line, mark time until the command **HALT** is given, when all halt.



Position of squad after completion of movement.

At the command **MARCH** the left cart halts or stands fast. The right cart moves straight to the front. The left cart follows the right cart in column as soon as sufficient ground is uncovered.

FIG. 186.—Right by carts

13–42. Cart movements.—*a.* **Cart right** is the movement prescribed for the right cart at the command **Squad right** (Pars. 13–41*a*.)

b. Being in line to form column of carts and march to the front, the command is: 1. **Right (left) by carts**, 2. **MARCH**. At the command **MARCH** the right cart moves or continues to move straight to the front. The left cart stands fast if halted or marks time if marching, and follows the right cart in column as soon as sufficient ground has been uncovered. (Fig. 186.)

c. Being in line to form column of carts and march to a flank the command is: 1. **Carts right (left)**, 2. **MARCH.** At the command **MARCH** the right cart executes **Cart right.** The left cart stands fast if halted or marks time if marching, and executes **Cart right** as soon as sufficient ground is uncovered following the right cart in column. (Fig. 187.)

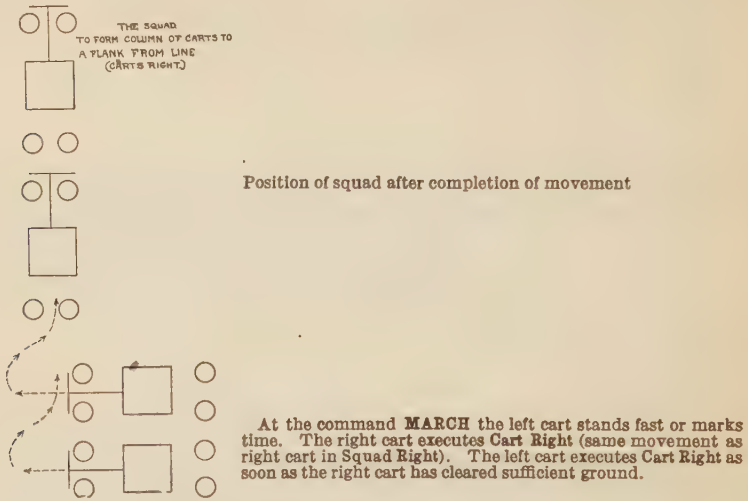


FIG. 187.—Carts right

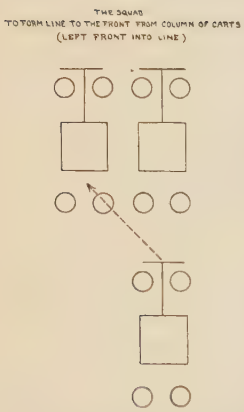


FIG. 188.—Left front into line

d. Being in column of carts to form line to the front the command is: 1. **Left (right) front into line,** 2. **MARCH.** At the command **MARCH** the leading cart stands fast if halted or halts if marching. The rear cart obliques into position and halts abreast of and to the left of the leading cart. (Fig. 188.)

e. Being in column of carts to form line to a flank, the command is: 1. **Line to the right (left),** 2. **MARCH,** 3. **Squad,** 4. **HALT,** 5. **FRONT.** At the command **MARCH** the leading cart executes **Right turn.** The rear cart moves or continues to move straight to the front until opposite its place in line when it executes **Right turn.** The third command is given when the leading cart has advanced the desired distance, no attempt being made to bring the rear cart abreast of the leading cart. The leading cart halts. The rear cart halts on arriving abreast of the leading (now left) cart and dresses to the left without command. At the command **FRONT** the men with the right cart turn head and eyes to the front. (Fig. 189.)

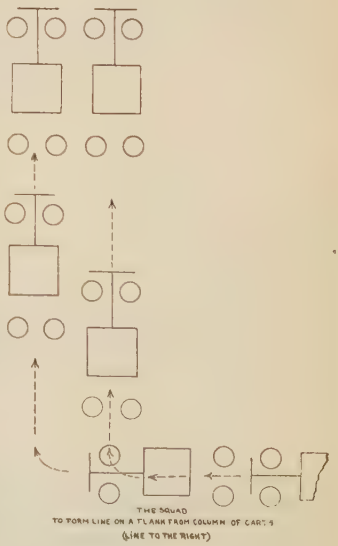


FIG. 189.—Line to the right

f. Being in column of carts to form line of carts to a flank, the command is: 1. **Carts right (left),** 2. **MARCH.** At the command **MARCH** each cart executes **Cart right.** The interval thus formed is maintained. (Fig. 190.)

g. Being in column of carts to change direction, the command is: 1. **Column right (left),** 2. **MARCH.** At the command **MARCH** the leading cart moves as prescribed for the right cart at the command **Right turn.** (Arts. 13–40*a*.) The rear cart turns similarly on the same ground and follows the leading cart in column.

h. Being in column of carts to march to the rear, the command is: 1. **Carts right (left) about,** 2. **MARCH.** At the command **MARCH** each cart moves as prescribed for the right cart at the command **Squad right about.** (Arts. 13–41*c*.)

13–43. Off carts and on carts.—In the case of the Lewis gun, Nos. 1, 2, and 3 constitute the gun crew and are charged with the duty of setting up or taking down the gun. The other members of the squad handle the remaining gear and establish the ammunition supply. For the Browning heavy these movements are executed as prescribed in TR 420–55, paragraphs 81–82, except for that part which refers to the formation of the squad (TR 420–55 not included in this publication). The squad forms as prescribed in articles 13–32.

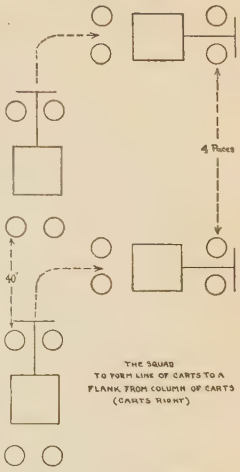


FIG. 190.—Carts right

The Platoon

13–44. Organization.—*a.* The machine-gun platoon consists of a platoon headquarters and 2 sections of 2 squads each. The platoon headquarters comprises 1 ensign (platoon leader), 1 platoon c. p. o. (second in command), 2 p. os. (agent and transport), and 7 seamen (runners).

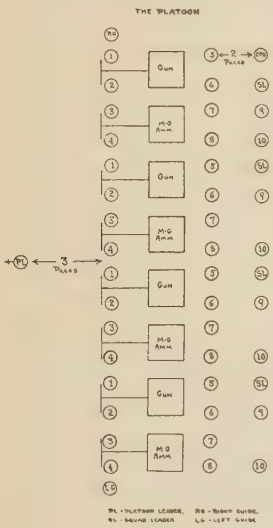


FIG. 191.—Machine-gun platoon

b. From 2 to 5 machine-gun squads and a leader may comprise a machine-gun platoon. Six squads are formed as 2 platoons of 4 and 2 squads each, respectively. Six squads are formed as 2 platoons of 3 squads each for parade purposes only, the tactical unity of the section being broken only for such purposes.

c. In each platoon men are assigned to squads without reference to height so that each squad will have its proper proportion of large men. Men are assigned to the duties which they are best fitted to perform. The integrity of squads is maintained. If any squad contains fewer than 6 men it is temporarily increased to that number for cart drill by transfer from other squads or from runners of the platoon headquarters. When the platoon becomes so reduced in numbers that there are less than 6 men in each squad the rear rank may be done away with and squads in column take their distance from the carts of the squad they cover instead of from the rear rank of the squad they cover.

d. For the purpose of formations or drills runners are used to fill blank files.

e. Transport petty officers, agents, and runners form in the line of file closers.

f. In the machine-gun platoon section leaders act as guides.

g. Platoons are numbered as in rifle-platoon drill. Machine-gun squads are numbered similarly to rifle squads in rifle-platoon drill. For convenience in giving commands and for reference, the terms right, left, center, leading, and rear are applicable as in rifle-platoon drill.

13–45. Formations.—*a.* The formations of the platoon are: **Line, Extended line, Line of squads, Column of squads,** and **Column of carts.**

b. Definitions:

(1) **Line.** That formation of the platoon in which the carts are arranged abreast with 4 inches interval between carts and between squads.

(2) **Extended line.** That formation of the platoon in which the carts are arranged abreast with more than 4 inches interval between squads and with normal 4 inches interval between carts within each squad.

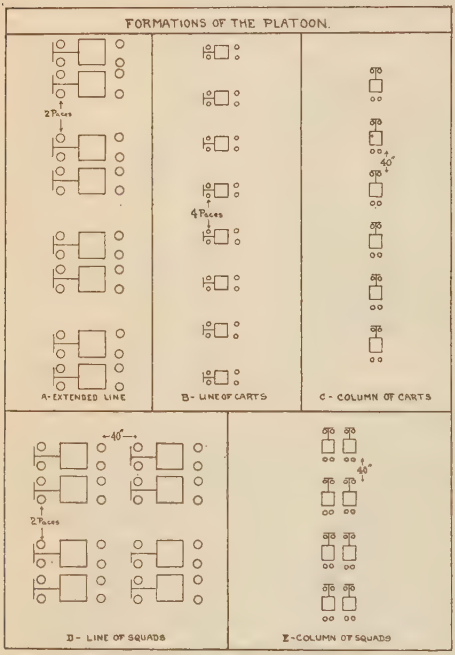


FIG. 192

(3) **Line of carts.** That formation of the platoon in which carts are arranged abreast with more than 4 inches interval between squads and between carts within each squad.

(4) **Line of squads.** That formation of the platoon in which the squads, each in line, are arranged abreast.

(5) **Column of squads.** That formation of the platoon in which the squads, each in line, are arranged one behind the other.

(6) **Column of carts.** That formation of the platoon in which the squads, each in column of carts, are arranged one behind the other.

13–46. General rules.—*a.* The platoon executes the movements enumerated above, the command **Platoon** being substituted for **Squad** in the proper cases. The platoon marches at **At ease, Route step,** and **Increases** and **Diminishes the front of a column** in accordance with the principles prescribed for the rifle platoon, the command **Carts** being substituted for **Twos** in the latter case and the diminishing of the front to a column of files being disregarded. The platoon **Obliques, Resumes the direct march,** and executes **Off carts** and **On carts** as previously prescribed. The platoon is **Aligned, Preserves alignment,** and **Opens** and **closes ranks** in accordance with the principles previously prescribed. (Arts. 3–6 and 3–7.)

b. If any command requires successive execution by subdivisions, the subdivisions halt or mark time if necessary to gain room for execution.

c. Any movement may be executed in double time.

d. In successive movements executed in double time, except **on right (left) into line,** the leading or base element marches in quick time. The other units march in double time to their places in the formation ordered and then conform to the leading or base unit. If marching in double time the command **Double time** is omitted. The leading or base element marches in quick time; the other units continue in double time to their new places in the formation and then conform to the gait of the leading or base unit.

e. The movements prescribed for the platoon may be executed by the machine-gun section whenever practicable, in the proper cases substituting the word **section** for **platoon** in the commands.

13–47. To form the platoon.—*a.* To form the platoon in close line the platoon c. p. o. takes post 6 paces in front of and facing the position the center of the platoon is to occupy and commands: 1. **First (second) platoon,** 2. **FALL IN.**

b. The section p. o. of the right section (right guide) places himself facing to the front so that the center of the platoon will be opposite to and 6 paces from the platoon c. p. o. and supervises the formation.

c. The platoon c. p. o. then commands: **REPORT.** Remaining in position, the squad leaders, in succession from the right, report "All present" or "——

absent." The platoon c. p. o. then gives the prescribed command for inspecting arms, if necessary, faces about, and reports "Sir, all present or accounted for" or "Sir, —— men absent" and without command takes his post.

d. The platoon leader takes post 12 paces in front of the center of the platoon, facing it, in time to receive the report of the platoon c. p. o.

e. In forming the platoon all who are required to make a report salute and maintain same until the report is acknowledged. The same principle applies when forming the company.

13–48. To dismiss the platoon.—*a.* The platoon being in line or close line at a halt, the platoon leader directs the platoon c. p. o.: **Dismiss the platoon.**

b. The platoon c. p. o. moves to a point 3 paces in front of the center of the platoon, salutes, faces toward the platoon, and gives the prescribed commands for inspecting arms, if necessary. He then gives the necessary directions as to cleaning and storage of equipment and directs the squad leaders: **TAKE CHARGE OF YOUR SQUADS.**

c. At this command, the squad leaders take charge of their respective squads and supervise the unloading, cleaning, and storage of equipment.

13–49. Movements from line.—*a. To form column of squads (carts) to the front.*—The platoon being in line, the command is: 1. **Right (left) by squads (carts)**, 2. **MARCH.** At the command **MARCH** the right squad moves straight to the front, taking four full steps, then eight half steps, and then resuming the full step. The remaining squads stand fast if halted or mark time if marching, and, as soon as uncovered, at command of their leaders successively execute **squad right** and **left turn** so as to follow the base squad in column.

TO FORM COLUMN OF SQUADS TO THE FRONT FROM LINE (RIGHT BY SQUADS)

FIG. 193

Fifth count after the command **MARCH**: The right squad has advanced four full steps and one half step. The right-center squad has advanced two full steps, its left cart taking 36-inch steps. (Each squad steps off after the squad on its right has advanced three counts.) The left-center squad is about to take its two steps to the front before turning on its fixed pivot. The right guide has started to move to his new position. (For original formation see Machine Gun Platoon in Line, fig. 191.)

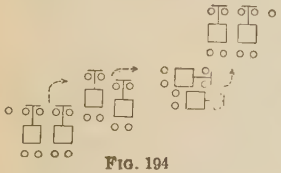


FIG. 194

Eighth count after the command **MARCH**: The right squad has advanced three more half steps. The right-center squad has completed its **Squad right** and is about to execute **Left turn** and follow the right (now leading) squad in column. The left-center squad has taken its two steps preliminary to turning. The left squad is about to move forward. The right guide has nearly reached his new position.

b. To form column of squads or carts to a flank.—The platoon being in line, the command is: 1. **Squads (carts) right (left)**, 2. **MARCH.** At the command **MARCH** the right squad executes **Squad right.** The remaining squads stand fast if halted or, if marching, mark time. As soon as sufficient ground is uncovered, the remaining squads at command of their leaders successively execute **Squad right** and take up the march in column.

c. To form column of squads or carts and march to the rear.—The platoon being in line, the command is: 1. **Squads (carts) right (left)**, 2. **Column right (left)**, 3. **MARCH.** The right squad initiates **Column right** as soon as it has completed the **Squad right.**

d. To turn the platoon.—The platoon being in line, the command is: 1. **Platoon right (left)**, 2. **MARCH**; 3. **Platoon**, 4. **HALT**; or 3. **Forward**, 4. **MARCH**; or, instead of halting, the platoon may execute by proper command such other steps or marchings as are prescribed. At the command **MARCH** the right guide steps back, takes post on the flank, and marks time. The right squad executes **Squad right** and marks time. The other squads oblique to the right and when in rear of their place in line oblique a second time, place themselves abreast of the base squad, and mark time. The command **HALT** or **MARCH** or other command involving movement is normally given when the left guide arrives on the line, except that the command **HALT** may be given any time after the movement begins. Only those halt who have completed the movement. Others halt and align themselves upon arriving on the line. (See fig. 195 C.)

e. To change direction.—The platoon being in line, the command is: 1. **Right (left) turn,** 2. **MARCH**; 3. **Platoon,** 4. **HALT**; or 3. **Forward,** 4. **MARCH.** At the command **MARCH** the right guide faces to the right in marching and takes the half step. The right squad executes **Right turn,** lessening its oblique slightly so as to place itself beside the guide. The **Right turn** being completed, this squad takes up the half step. The remaining carts of the platoon execute **Right oblique,** march until in rear of their place in line, execute a second oblique, and take the half step on arriving abreast of the base squad. The fourth command is given so that the halt or other movement will begin as the left guide arrives on the line. (See fig. 195 B.)

f. To form extended line.—The platoon being in line, the command is: 1. **Extend on right (left) squad,** 2. **MARCH.** At the command **MARCH** the right squad moves or continues to move straight to the front. The remaining squads, cautioned by their leaders, execute **Left oblique** and, when they have gained the proper interval (2 paces), resume the march in the original direction and place themselves on line with the base squad. (See fig. 195 A.)

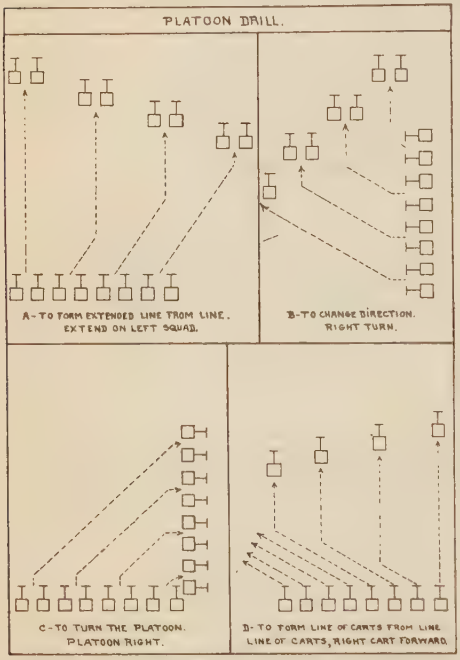


FIG. 195

g. To form line of carts.—The platoon being in line, the command is: 1. **Line of carts,** 2. **Right (left) cart forward,** 3. **MARCH.** At the command **MARCH** the right cart marches or continues to march straight to the front. The remaining carts oblique to the left until they have gained the proper interval (2 paces), when they resume the original direction of march and align themselves on the base cart. (See fig. 195 D.)

h. To form line of squads.—The platoon being in line, the command is: 1. **Squads,** 2. **Right (left) by carts,** 3. **MARCH.** At the command **MARCH** each squad executes **Right by carts.** The interval thus formed is maintained. (See fig. 196 A.)

13–50. Movements from extended line.—*a. To form column of squads to the front.*—The command is: 1. **Right (left) by squads,** 2. **MARCH.** At the command **MARCH** the right squad moves as in forming column of squads to the front from **Line** (art. 13–49*a*). The remaining squads execute **Squad right** and **Left turn** so as to follow the leading squad in column.

b. To form column of carts to the front.—The command is: 1. **Right (left) by carts,** 2. **MARCH.** At the command **MARCH** the right cart of the right squad moves as in the formation of column of carts from **Line.** The left cart of the right squad follows in column as soon as sufficient ground is uncovered. In each of the remaining squads the right cart executes **Cart right** with the left cart of the squad on its right, the left cart of the left squad initiating **Cart right** as soon as enough ground is uncovered. Each cart except those of the right squad executes **Left turn** on the same ground when in rear of the leading cart and follows the preceding cart in column.

c. To form column of squads to a flank.—The command is: 1. **Squads right (left),** 2. **MARCH.** At the command **MARCH** each squad executes **Squad right.** (See fig. 196 B.)

d. To form column of carts to a flank.—The command is: 1. **Carts right (left),** 2. **MARCH.** At the command **MARCH** the right cart executes **Cart right.** The remaining carts stand fast if halted or mark time if marching. As soon as enough ground is uncovered each cart executes **Cart right** and follows the preceding cart in column. The right cart of each squad executes **Carts right** with the left cart of the squad on its right.

e. To form column of squads or carts and march to the rear.—The command is: 1. **Squads (carts) right (left)**, 2. **Column right (left)**, 3. **MARCH.** The right squad initiates **Column right** as soon as it has completed **Squad right.**

f. To form line.—The command is: 1. **Close on right (left) squad**, 2. **MARCH**, 3. **Platoon**, 4. **HALT.** At the command **MARCH** the right squad marches or continues to march straight to the front. The remaining squads oblique to the right until the interval between squads is closed to 4 inches, when all move forward. At the command **HALT** the leading squad halts. The other squads halt and dress on arriving abreast of the base squad. (See fig. 196 E.)

g. To form line of carts.—The command is: 1. **Line of carts**, 2. **Right (left) cart forward**, 3. **MARCH**, 4. **Platoon**, 5. **HALT.** At the command **MARCH** the right cart moves or continues to move straight to the front. The remaining carts oblique to the left until they have gained their proper interval (2 paces), when they resume the original direction of march. At the fifth command the right cart halts. The other carts halt on arriving abreast of the right cart. (See fig. 196 C.)

h. To form line of squads.—The command is: 1. **Squads**, 2. **Right (left) by carts**, 3. **MARCH.** At the command **MARCH** each squad executes **Right by carts.** (See fig. 196 D.)

i. To turn the platoon.—Executed by the same command and in the same manner as when done from **Line.**

j. To change direction.—Executed by the same command and in the same manner as when done from **Line.**

13–51. Movements from line of carts.—*a. To form column of carts to the front.*—The command is: 1. **Right (left) by carts**, 2. **MARCH.** At the command **MARCH** the right cart moves or continues to move straight to the front taking 4 full steps, 8 half steps, and then resuming the full step. The remaining carts execute **Carts right** and then **Left turn** so as to follow the right cart in column.

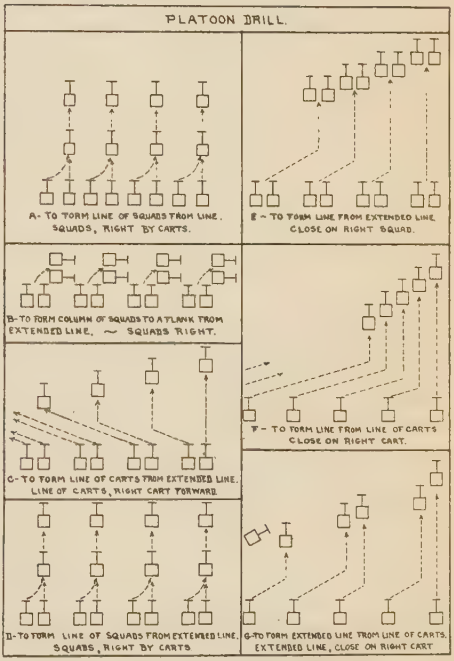


Fig. 196

b. To form column of carts to a flank.—The command is: 1. **Carts right (left)**, 2. **MARCH.** At the command **MARCH** each cart executes **Cart right** and all take up the march in column.

c. To form column of carts and march to the rear.—The command is: 1. **Carts right (left)**, 2. **Column right (left)**, 3. **MARCH.** The right cart initiates **Column right** as soon as it has completed **Cart right.**

d. To form line.—The command is: 1. **Close on right (left) cart**, 2. **MARCH.** At the command **MARCH** the right cart moves on, continues to move straight to the front. The remaining carts oblique to the left until the interval between carts is closed to 4 inches, when all take up the march in the original direction and align themselves on the base cart. (See fig. 196 F.)

e. To form extended line.—The command is: 1. **Extended line**, 2. **Close on right (left) cart**, 3. **MARCH**, 4. **Platoon**, 5. **HALT.** At the command **MARCH** the right cart moves or continues to move straight to the front. The remaining carts oblique to the right until there is 4 inches interval between carts within each squad and 1½ paces interval between squads, when all resume the original direction of march. At the fifth command the base squad halts, the remaining squads halt on arriving abreast of the base squad. (See fig. 196 G.)

f. To form line of squads.—The command is: 1. **Squad right (left) by cart,** 2. **MARCH,** 3. **Platoon,** 4. **HALT.** At the command **MARCH** each squad executes **Right by carts.** The right squad moves straight to the front in column. The remaining squads each in column oblique to the right until the interval between squads is reduced to 2 paces, when all resume the original direction of march. At the fourth command the leading squad halts. The remaining squads halt on arriving abreast of the base squad. (See fig. 197 D.)

g. To turn the platoon.—Execute by the same command and in the same manner as in turning the platoon from **Line** substituting the word **Cart** for **Squad** where the latter appears in the instructions.

h. To change direction.—Executed by the same command and in the same manner as in changing direction from **Line,** substituting **Cart** for **Squad** where the latter word appears in the instructions.

13–52. Movements from column of squads.—*a. To change direction.*—The command is: 1. **Column right (left),** 2. **MARCH.** At the command **MARCH** the leading squad turns on a moving pivot as prescribed in article 13–40*a*, the remaining squads turn in the same manner and follow the leading squad in column.

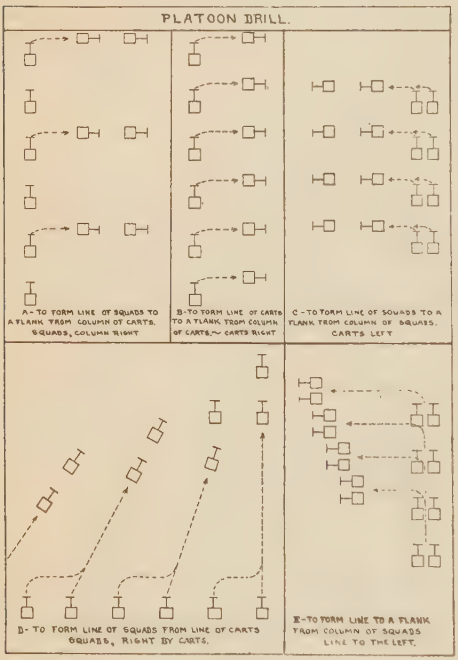


FIG. 197

b. To form line to the front.—Executed by the same command and as prescribed for the rifle platoon (arts. 3–19*b*), omitting reference to rifles. The command **DRESS** is given immediately after the halt is completed.

c. To form line to a flank.—The command is: 1. **Line to the right (left),** 2. **MARCH,** 3. **Platoon,** 4. **HALT,** 5. **FRONT.** At the command **Line to the right** the leader of the remaining squads command **Forward** if halted, or **Continue the march** if marching. At the command **MARCH** each squad executes the command given by its leader. Each squad, when opposite its place in line, executes **Right turn** at command of its leader. The command **HALT** is given when the leading squad has advanced the desired distance. The leading squad halts. Its leader then commands: 1. **Right,** 2. **DRESS.** Each of the remaining squads is halted on the line by its leader, who then commands: 1. **Right,** 2. **DRESS.** All dress on the first squad in line. The command **FRONT** is given as soon as all are aligned. (See fig. 197 E.)

d. To form extended line to a flank.—The command is: 1. **Squads right (left),** 2. **MARCH.** At the command **MARCH** each squad executes **Squad right.** The interval thus formed is maintained.

e. To form line of squads to a flank.—The command is: 1. **Carts right (left),** 2. **MARCH.** At the command **MARCH** the right cart of each squad executes **Cart right.** The left cart of each squad stands fast if halted, or marks time if marching, and executes **Cart right** as soon as sufficient ground is uncovered, following its right cart in column. (See fig. 197 C.)

f. To form line on the right or left.—Executed as prescribed for the rifle platoon (arts. 3–19*d*), omitting the last sentence of subparagraph (1). The command **DRESS** is given as soon as the halt is completed.

13–53. Movements from column of carts.—*a.* To change direction, the command is: 1. **Column right (left),** 2. **MARCH.** At the command **MARCH** the leading cart executes **Right turn.** The remaining carts execute the same movement on the same ground and follow the leading cart in column.

b. To form line of carts to a flank.—The command is: 1. **Carts right (left)**, 2. **MARCH.** At the command **MARCH** each cart executes **Cart right.** (See Fig. 197 B.)

c. To form line of squads to a flank.—The command is: 1. **Squads**, 2. **Column right (left)**, 3. **MARCH.** At the command **March** each squad executes **Column right**, the base squad moving straight to the front, when the movement is completed and the remaining squads guiding on the base squad. (See fig. 197 A.)

d. To form column of squads.—The command is: 1. **Squads**, 2. **Right (left) front into line**, 3. **MARCH.** At the command **March** the leading cart halts. The remaining carts of the leading squad obliques into position on the line with and to the right of the leading cart and halts. The remaining squads close up and successively form in rear of the leading squad in like manner.

13–54. Movements to the rear.—*a. The platoon being in line to face or march the unit to the rear*, the command is: 1. **Squads right (left) about**, 2. **MARCH**, or, 1. **Squads right (left) about**, 2. **MARCH**, 3. **Platoon**, 4. **HALT.** Executed by each squad as prescribed in articles 13–41 *c–d*, except that men at drags of the right cart of each squad raise the drags to the height of their chins as they swing so as to clear the squad on their right.

b. The platoon being in column of squads, to face or march to the rear, the command is: 1. **Squads right (left) about**, 2. **MARCH**, or, 1. **Squads right (left) about**, 2. **MARCH**. 3. **Platoon**, 4. **HALT.** Executed by each squad as prescribed in articles 13–41 *c–d*).

c. The platoon being in column of carts, to face or march the unit to the rear, the command is: 1. **Carts right (left) about**, 2. **MARCH**, or, 1. **Carts right (left) about**, 2. **MARCH**, 3. **Platoon**, 4. **HALT.** Each cart moves as prescribed for the right cart of the squad at the command **Squad right about** in articles 13–41 *c–d*.

The Company

13–55. Organization.—The machine gun-howitzer company consists of a company headquarters, 2 machine-gun platoons, and a howitzer platoon. In drills, the company headquarters does not ordinarily fall out with the rest of the company. When the presence of the company headquarters as a unit is desired at drills it is maneuvered as an additional platoon and is posted on the right of the company in line and at the head of the company in column formations.

13–56. Formations.—*a.* The formations of the company are: **Line, Extended line, Column of platoons, Close column, Column of extended platoons, Close column of extended platoons, Line of platoons, Close line,** and **Column of squads.** (Fig. 198.)

b. Definitions:

(1) **Line.** That formation of the company in which platoons are abreast, each platoon in line, with an interval of 5 paces between platoons.

(2) **Extended line.** That formation of the company in which platoons are abreast, each platoon in extended line, with an interval of 5 paces between platoons.

(3) **Column of platoons.** That formation of the company in which platoons, each in line, are placed one behind the other at normal distance (platoon front plus 5 paces, which usually equals 20 paces).

(4) **Close column.** That formation of the company in which the platoons, each in line, are placed one behind the other at 7 paces distance.

(5) **Column of extended platoons.** That formation of the company in which the platoons, each in extended line, are placed one behind the other at distance equal to platoon front plus 5 paces (usually 25 paces).

(6) **Close column of extended platoons.** That formation of the company in which the platoons, each in extended line, are placed one behind the other at 7 paces distance.

(7) **Line of platoons.** That formation of the company in which the platoons, each in column of squads, are placed abreast at normal interval (20 paces).

(8) **Close line.** That formation of the company in which the platoons, each in column of squads, are placed with the leading squads abreast with 7 paces interval between platoons.

(9) **Column of squads.** That formation of the company in which the platoons, each in column of squads, are placed one behind the other at 4½ paces distance.

c. The company assembles in **Line, Extended line, Close column,** or **Close column of extended platoons,** as directed.

d. At formation of the company in line, platoons are numbered consecutively from right to left. These designations do not change.

e. For convenience in giving commands and for reference the designations, right, left, center, leading, and rear are applied to the actual right, left, center, leading, and rear platoons.

13–57. General rules.—*a.* Platoon leaders repeat preparatory commands and place themselves in dressing as prescribed in article 3–25.

b. The company executes the movements prescribed for the platoon in article 13–48 *a*, substituting **Company** for **Platoon** in the commands.

c. Subparagraphs *j*, *k*, *l*, and *m*, of article 3–25, are applicable.

d. When the company consists of 6 machine-gun squads and the howitzer platoon, the machine guns will form as one platoon of 4 guns and one platoon of 2 guns, never as two platoons of 3 guns each.

To form and dismiss the company.—Done as prescribed for the rifle company (arts. 3–26 and 3–27), omitting all reference to arms.

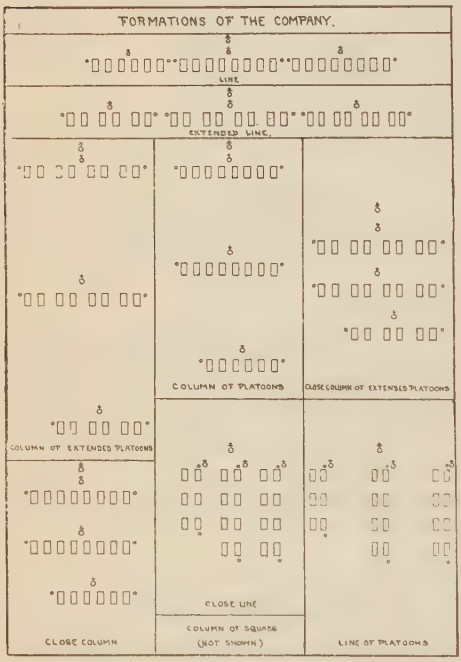


FIG. 198

To give the company a new alignment.—Done as prescribed for the rifle company (art. 3–29), omitting all reference to arms.

To open and close ranks.—Done as prescribed for the rifle company (art. 3–30), omitting all reference to arms.

To rectify the column.—Done as prescribed for the rifle company (art. 3–31).

13–58. Movements from line and Extended line.—*a. Being in line, to form extended line.*—The commands are: 1. **Squads right (left)**, 2. **MARCH**, followed by 1. **Squads left (right)**, 2. **MARCH**, the latter command being given after the first movement is completed.

b. Being in extended line to form line.—The command is: 1. **Platoons**, 2. **Close on right (left) squad**, 3. **MARCH**, or 1. **Squads right (left)**, 2. **Close on right (left) squad**, 3. **MARCH**, or, 1. **Squads right (left)**. 2. **MARCH**, and 1. **Line to the left (right)**, 2. **MARCH**.

c. Being in line to form column of platoons to the front, or, *being in extended line to form column of extended platoons to the front.*—The command is: 1. **Column of (extended) platoons**, 2. **Leading platoon, forward**, 3. **MARCH**. The leading platoon moves forward. The remaining platoons, cautioned by their leaders, execute **Squads right** and then **Squads left**, so as to follow the leading platoon in column. If **Column of platoons** is being formed, platoon leaders command: 1. **Squads left**. 2. **Close on right squad**, 3. **MARCH**, instead of: 1. **Squads left**, 2. **MARCH**, when opposite their place in column.

d. Being in line to form column of extended platoons to the front.—The command is: 1. **Column of extended platoons**, 2. **Leading platoon, extend on right (left), squad**. 3. **MARCH**. The leading platoon extends. The remaining platoons execute **Squads right**, and when in rear of their place in column, **Squads left**

e. Being in line to form column of platoons to a flank, or, *being in extended line to form column of extended platoons to a flank.*—The command is: 1. **Platoons**, 2. **Right (left) turn**, 3. **MARCH**; or, 1. **Platoons right (left)**, 2. **MARCH**, 3. **Company (forward)**, 4. **HALT (MARCH)**.

f. Being in line to form close column, or, *being in extended line to form close column of extended platoons.*—The command is: 1. **Close on right (left)**

platoon, 2. **MARCH.** The right platoon stands fast. The remaining platoons at command of their leaders, execute **Squads right, Column right,** then **Column left** and **Squads left** or **Squads left, Close on right squad,** and are halted upon arriving at the proper distance in rear of the base platoon.

g. Being in line or extended line to form column of squads to the front.—The command is: 1. **Column of squads,** 2. **Right (left) platoon, right (left) by squads,** 3. **MARCH.** The right platoon moves as directed. Other platoons, cautioned by their leaders, execute **Squads Right** and **Column Left** so as to follow the leading platoon in column of squads.

h. Being in line or extended line to form column of squads to a flank.—The command is: 1. **Squads right (left),** 2. **MARCH.**

13–59. Movements from Column of Platoon Formations.—*a. Being in column of platoons to form line to a flank;* or, *being in column of extended platoons to form extended line to a flank.*—The command is: 1. **Platoons,** 2. **Right (left) turn,** 3. **MARCH;** or, 1. **Platoons right (left),** 2. **MARCH,** 3. **Company (Forward),** 4. **HALT (MARCH).**

b. Being in column of platoons to form close column; or, *being in column of extended platoons to form close column of extended platoons.*—The command is: 1. **Close on leading platoon,** 2. **MARCH.** The leading platoon halts or stands fast. The remaining platoons move forward and halt upon arriving at their proper distance from the leading platoon.

c. Being in column of platoons or column of extended platoons to form column of squads to the front.—The command is: 1. **Platoons,** 2. **Right (left) by squads,** 3. **MARCH.** Executed simultaneously by all platoons.

d. Being in column of platoons or column of extended platoons to form column of squads to a flank.—The command is: 1. **Column of squads,** 2. **Leading platoon, squads right (left),** 3. **MARCH.** The leading platoon moves as directed. The remaining platoons, at command of their leaders, execute **Squads Right** on the same ground as the leading platoon in column of squads.

e. Being in column of platoons or column of extended platoons to form line of platoons to a flank.—The command is: 1. **Squads right (left),** 2. **MARCH.**

f. Being in close column or close column of extended platoons to form close line to a flank.—The command is: 1. **Squads right (left),** 2. **MARCH.**

g. Being in column of platoons or close column to form line to the front.—The command is: 1. **Right (left), front into line,** 2. **MARCH.** The leading platoon halts. The remaining platoons, cautioned by their leaders, execute **Squads Right.** When in rear of its place in line each of the remaining platoons, at command of its leader, executes **Squads Left, Close on Left Squad,** and then halts, dresses, and executes **Front** when it arrives on line with the leading platoon.

h. Being in column of extended platoons or close column of extended platoons to form extended line to the front.—The command is: 1. **Right (left) front into line,** 2. **MARCH.** Executed as above except that platoon leaders command **Squads Left** instead of **Squads Left, Close on Left Squad.**

i. Being in column of platoons to form line on a flank; or, *being in column of extended platoons to form extended line on a flank.*—The command is: 1. **On right (left) into line,** 2. **MARCH,** 3. **Company,** 4. **HALT.** The leading platoon executes **Right Turn.** The remaining platoons, successively, when opposite their places in line, execute **Right Turn.** The command **HALT** is given when the leading platoon has advanced the desired distance. It halts. The remaining platoons **Halt, Dress,** and execute **FRONT** upon arriving on line with the leading platoon.

j. Being in column of platoons to form column of extended platoons; or, *being in close column to form close column of extended platoons.*—The command is: 1. **Platoons,** 2. **Extend on right (left) squad,** 3. **MARCH.** Executed simultaneously by all platoons.

k. Being in column of platoons, column of extended platoons, close column, or *close column of extended platoons to form column of squads to a flank.*—The command is: 1. **Column of squads,** 2. **Leading platoon, squads right (left),** 3. **MARCH.** The leading platoon moves as directed in the command. The remaining platoons execute **Squads Right** on the same ground and follow the leading platoon in column of squads.

l. Being in column of platoons, column of extended platoons, close column, or *close column of extended platoons to change direction.*—The command is: 1. **Column right (left),** 2. **MARCH.** At the command **MARCH** the leading platoon executes **Right Turn.** The remaining platoons execute **Right Turn** on the same ground and follow the leading platoon.

m. Being in column of extended platoons to form column of platoons; or, *being in close column of extended platoons to form close column.*—The command is: 1. **Platoons,** 2. **Close on right (left) squad,** 3. **MARCH.** Executed simultaneously by all platoons.

n. Being in close column to form column of platoons; or, *being in close column of extended platoons to form column of extended platoons.*—The command is: 1. **Extend on rear platoon,** 2. **MARCH.** The leading platoon moves forward. The remaining platoons stand fast or halt until the platoon in front of it has gained its proper distance, when the march is taken up or resumed.

13-60. Movements from Line of Platoons and Close Line.—*a. Being in line of platoons to form line to the front.*—The command is: 1. **Platoons,** 2. **Right (left) front into line,** 3. **MARCH.** Executed simultaneously by all platoons.

b. Being in line of platoons to form column of platoons or *column of extended platoons to a flank;* or, *being in close line to form close column or close column of platoons* or *close column of extended platoons to a flank.*—The command is: 1. **Squads right (left)** 2. **MARCH**; or, if **Column of Platoons** or **Close Column** is to be formed: 1. **Squads right (left),** 2. **Platoons, close on right (left) squad.** 3. **MARCH.**

c. Being in line of platoons to form close line.—The command is: 1. **Close on right (left) platoon,** 2. **MARCH,** 3. **Company,** 4. **HALT.** The indicated platoon moves to the front. The remaining platoons execute **Column Half Right** and **Column Half Left** so as to be in rear of their place in line. At the command **HALT** the leading (right) platoon halts. The other platoons halt on arriving abreast of the right platoon.

d. Being in close line to form line of platoons.—The command is: 1. **Extend on right (left) platoons,** 2. **MARCH,** 3. **Company,** 4. **HALT.** The right platoon moves to the front. The other platoons execute **Column Half Left** and **Column Half Right** so as to gain their proper interval. At the command **HALT** the right platoon halts. The other platoons halt upon arriving abreast of the right platoon.

e. Being in line of platoons or *close line to form column of squads to the front.*—The command is: 1. **Column of squads,** 2. **Right (left) platoon forward,** 3. **MARCH.** The right platoon moves forward. The remaining platoons stand fast, if necessary, and execute **Column Half Right** and **Column Half Left** so as to follow the right platoon in column of squads at the proper distance.

f. Being in line of platoon to form column of squads to a flank.—The command is: 1. **Platoon,** 2. **Column right (left),** 3. **MARCH.** Executed simultaneously by all platoons.

g. Being in line of platoons or close line to change direction.—The command is: 1. **Company right (left),** 2. **MARCH,** 3. **Company,** 4. **HALT.** At the command **MARCH** the right platoon executes **Column Right.** The remaining platoons are marched by the shortest route to their places abreast to the right platoon. At the command **HALT** the right platoon halts. The other platoons halt when arriving abreast of the right platoon. At the command **HALT** the right platoon halts. The other platoons halt when arriving abreast of the right platoon.

13-61. Movement from Column of Squads.—*a. Being in column of squads to form line to the front.*—The command is: 1. **Right (left) front into line,** 2. **MARCH.** The leading platoon executes **Column Right, Squads Left, Close on Left Squad,** and halt. The remaining platoon executes **Column Right,** and when in rear of their place in line, **Squad Left, Close on Left Squad.** They halt on arriving on line with leading platoon.

b. Being in column of squads to form extended line to the front.—The command is: 1. **Right (left) front into extended line,** 2. **MARCH.** Executed as above except that platoons do not execute **Close on Left Squad.**

c. Being in column of squads to form line to a flank.—The command is: 1. **Line to the right (left),** 2. **MARCH.** The leading platoon executes **Line to the Right.** The remaining platoons execute **Line to the Right** at command of their leaders when they have arrived opposite their place in line.

d. Being in column of squads to form extended line to a flank.—The command is: 1. **Squads right (left),** 2. **MARCH.**

e. Being in column of squads to form line on a flank.—The command is: 1. **On right (left) into line,** 2. **MARCH.** 3. **Company,** 4. **HALT.** The leading platoon executes **Squads Right, Close on Right Squads.** The remaining platoons execute the same movement when opposite their places in line. At

the command **HALT** the leading platoon halts. Other platoons halt when arriving on line with the leading platoon.

f. Being in column of squads to form column of platoons to the front.—The command is: 1. **On right (left) into extended line**, 2. **MARCH.** Executed as above except that platoons execute **Squads Right** instead of **Squads Right, Close on Right Squad.**

g. Being in column of squads to form column of platoons to the front.—The command is: 1. **Platoons**, 2. **Right (left) front into line**, 3. **MARCH.** Executed simultaneously by all platoons.

h. Being in column of squads to form column of extended platoons to a flank.—The command is: 1. **Column of extended platoons**, 2. **Leading platoon squads right (left)**, 3. **MARCH.** The leading platoon moves as directed. The other platoons execute **Squads Right** on the same ground and follow the leading platoon in column.

i. Being in column of squads to form line of platoons, or close line.—The command is: 1. **Line of platoons**, 2. —— **paces right (left)**, 3. **MARCH.** 4. **Company**, 5. **HALT.** The leading platoon moves forward. The remaining platoons change direction to the right until the desired interval is obtained when they change direction to the left. At the command **HALT** the leading platoon halts. The remaining platoons halt on arriving abreast of the leading platoon.

j. To change direction.—The command is: **Column right (left)**, 2. **MARCH.** pxecuted by the leading platoon as previously prescribed and by the remaining Elatoons on the same ground and in the same manner.

Ceremonies

13–62. Forming for parades and reviews.—*a.* When the battalion is to be formed in line, the machine gun-howitzer company may be formed in line or in extended line. In the former case line may be formed by two methods; being in column of squads, on arriving in rear of the position, the command: **Line to the Right (Left) MARCH**, may be given. If it is not desired to halt on line from a successive formation, the command **Double Time** may be given before **MARCH.** The base squad moves in quick time, the remaining squads moving in double time until abreast of the base squad, when all resume the quick time. The movement may also be accomplished by the command: **Squads right (Left), Close on Left (Right), MARCH** is sufficient.

When it is desired to form in extended line, the command **Squads Right (Left), MARCH** is sufficient.

b. When the battalion is to be formed in line of close columns, the machine gun-howitzer company may form in close column or in close column of extended platoons. In approaching the position from a flank, to form close column from column of squads, the command is: **Column of platoons, leading platoon, line to the left (right), MARCH, Company, HALT. Close on leading Platoon, MARCH. HALT** is given when the leading platoon arrives on the line. The **Dress** and **Front** are omitted until after the **Close on Leading Platoon** has been executed.

If close column of extended platoons is the desired formation, the command is: **Column of extended platoons leading platoon squads left (right), MARCH, Close on leading platoon, MARCH.**

c. Should the battalion form in close line, the machine gun-howitzer company forms in close line with the howitzer platoon on the right. If approaching the position from the flank in column of squads, the command to form close line is: **Column left (right), MARCH. Line of Platoons, 7 paces left (right), MARCH**, platoons halting successively on the line.

d. Should the rifle companies be so depleted as to have only one platoon each when the machine gun-howitzer company has 2 or more platoons, the machine gun-howitzer company will form in close column or in close column of extended platoons.

13–63. Passing in review.—*a.* When the battalion is in line, if the machine gun-howitzer company is in line, it executes **Squads Right** at the command **MARCH** given by the battalion commander, and **Column Left** at the first change of direction. At the second change of direction, the company commander commands: **Column of platoons, leading platoon, squads right, close on right squad, double time, MARCH**, and the company passes in review in column of platoons. If the company is in extended line it executes **Squads Right** and **Column Left** as above. At the second change of direction, the company commander commands: **Column of extended platoons, leading**

platoon, squads left, MARCH, and the company passed the reviewing stand in column of extended platoons.

b. When the battalion is in line of close columns and the machine gun-howitzer company is in close column, the company commander commands **Squads Right** as soon as the company on his right has cleared. At the first change of direction he commands: **Squads Left, MARCH**, forming close column of extended platoons. At the second change of direction he commands: **Squads Left, MARCH**, forming close line, and passes the reviewing stand in that formation.

c. Should the battalion be formed in close line, the machine gun-howitzer company executes squads right when the company on its right is clear. At the first change of direction the company commander commands: **Squads left, platoons close on right squad, double time, MARCH**, or **Squads Left**, depending on whether the company is to pass the reviewing stand in close column or in column of extended platoons.

13–64. Inspections.—The company being in line, extended line, column of platoons at full distance, or column of extended platoons at full distance, ranks are opened as in the rifle company, the rear rank marching backward 4 steps. At the company commander's command: **Prepare for inspection**, platoon leaders command: **Lay out equipment.** Equipment is layed out in accordance with paragraph 126, TR 420–55, except that Cole carts are aligned with drags grounded and drag handles 4 paces in rear of the line of file closers. The inspection takes place as prescribed in paragraph 127, TR 420–55. (TR 420–55 not included in this manual.) On completion of the inspection the platoon leader commands: **On carts**, and then: **Close Ranks, MARCH.**

Section III.—EXTENDED ORDER, THE MACHINE-GUN SQUAD, SECTION, AND PLATOON

13–65. General principles governing extended order.—In combat, machine-gun units take up extended-order formations in order to make effective use of their weapons and to minimize casualties. The extension is governed by the mission to be performed and the nature of the ground. It must admit of proper control by the leader. Well-trained and disciplined units can, without sacrificing control, be deployed with greater intervals and distances than poorly trained and undisciplined units.

13–66. Rules for deployment.—*a.* Deployments may be executed from any formation. They are usually executed from column of squads, twos, or files.

b. The direction of deployment will ordinarily be designated prior to deployment. The direction may be indicated by designating a prominent object on the ground, by signal, or by a combination of both. If the deployment is to be made in a direction varying considerably from the direction of march, the units should change direction before deploying. If no direction is designated, units deploy straight to their front. When an advance is to be continued for a considerable period of time on an assigned direction line, the magnetic azimuth of advance should be announced before deployment. When an advance is to be conducted in darkness or through woods, the magnetic azimuth should always be announced.

c. The leading squad is the base of deployment from column. The base element is designated before deployment from line. The base squad does not change after deployment unless otherwise ordered. Machine-gun units regulate their march in general upon the rifle unit which they are supporting.

13–67. Movement.—*a.* A deployed machine-gun unit advances, halts, moves by the flank, obliques, resumes the forward march, passes from quick to double time and the reverse as prescribed in chapters 2 and 3. Changes in the direction of march are usually effected by assigning a new march direction to base squads. The remainder of the unit conforms to the change of direction of the base squad by gradual obliques and by opening out from, or closing in on, the base squad.

b. Machine-gun units have no fixed position in the general deployment. The advance is made by long bounds from firing position to firing position. The time of movement, rate of advance, and route are determined by the leader of the machine-gun unit in conformity with the tactical situation.

c. Movement may be interrupted by the command or signal to **Halt, Lie down, Off carts**, or **Action.** On halting, units take advantage of cover. If halted by the command or signal **Off carts**, the squads prepare for action.

If halted by the command **Action**, squad leaders cause their guns to go into action in the positions designated.

13–68. Signals.—*a.* Units are assembled, deployed, maneuvered, and put into action as far as practicable by signals. The signals prescribed for the infantry will be used for controlling the movement. If necessary, prearranged signals may be used to supplement those laid down in regulations. Whistle signals are used sparingly, being limited to moments during the fire fight when, on account of the noise of battle, it is impossible to attract attention by other means. The habitual use of the whistle preliminary to a command is prohibited.

b. The following special signals used in controlling machine-gun units in extended-order formations are listed for convenience:

(1) **Action.**—Thrust the fist several times in the direction toward which it is desired to go into action.

(2) **Out of action.**—Strike the closed fist of one hand rapidly against the open palm of the other several times.

(3) **Off carts.**—Face the unit for whom the signal is intended. Raise the elbow laterally to the height of the shoulder and touch the shoulder with the fingers.

(4) **On carts.**—Face the unit for whom the signal is intended; raise both elbows laterally to the height of the shoulders and touch the shoulders with the fingers.

(5) **Echelon formation.**—Face the unit for whom the signal is intended. Extend both arms horizontally to the front, fists, closed. Withdraw either fist halfway toward the body by flexing the arm at the elbow.

13–69. Preliminary training.—Instruction in the mechanism of extended order may be taken up in conjunction with the preliminary drill of the machine gun. Training in extended-order exercises is preferably preceded by instruction in visual training and use of ground and cover. In this preliminary training, methods of concealing the gun from terrestrial and aerial observation will be emphasized. The use of background, natural and artificial, terrain features, and camouflage should be first demonstrated, then practiced.

Extended Order of the Machine-Gun Squad

13–70. Duties of the squad leader.—The squad is deployed and led by the squad leader. During movement the normal position of the squad leader is at the head of his squad when deployed in squad column and in the center of his squad when deployed in line. It is his duty to guide on the base unit, watch the section leader for signals, and lead his squad in the assigned direction making skillful use of ground and cover. He will prevent bunching of the squad, particularly at the gun position. When resuming the advance after a halt, the squad leader will insure that all members of the squad have understood and obeyed the order to move forward. In case of casualties he will prescribe such redistribution of the loads of members of the squad as will insure the arrival at the firing position of all equipment necessary for immediate opening of fire.

13–71. Formations.—*a.* The normal extended-order formation is the squad column, with the individuals arranged one behind the other in the following order: Squad leader, Nos. 1, 2, 3, 4, 5, 6. Nos. 7 and 8 follow No. 6 when the carts do not accompany the squad. When crossing open spaces covered by aimed small-arms fire of the enemy, the squad columns are preferably staggered as shown in Figure 199. When the gun and ammunition carts accompany the squad, they follow behind the last number in file. The distance between individuals is normally 5 paces. This distance is flexible. It is increased or diminished depending on the cover, visibility, and the requirements, of proper control. At night, in fog, or smoke, or when advancing through woods, distances are shortened to the limits of visibility in order to prevent loss of control and contact.

b. In order to conceal the identity of the squad when moving forward with rifle units or when advancing over open ground to a firing position in the rifle firing line, a line formation may be assumed. It may also be used to cross a short space swept by the aimed fire of enemy rifles and automatic weapons. This formation is not used when the squad is accompanied by its carts, nor will it be used except for the specific purposes enumerated above. The interval between men deployed in line is normally 5 paces. This interval may be increased or diminished in conformity with the nature of the ground, the intensity of hostile fire, and the requirements of control. A formation in line is not suitable for ad-

vancing in darkness, smoke, or fog, or for going through woods because of the danger of loss of control and direction.

c. When the squad is advancing over difficult ground, two or more men, in addition to the mule leaders and their assistants, are detailed to assist the carts forward. Squads assigned the mission of protecting a column from low-flying aircraft during marches mount the gun on a cart in the most convenient manner. The gunner and his assistant march in rear of the cart upon which the gun is mounted.

d. When action is expected during the march and before deployment, squads march in rear of or alongside their carts.

13–72. Preparation for action.—*a.* When it is desired to remove the gun equipment from the carts, the command or signal **Off carts** is given.

The petty officer secures the panoramic sight, cleaning rod, and one spare barrel.

No. 1 secures the tripod and gunner's pouch. He adjusts the tripod so that it is convenient to carry on his back.

No. 2 secures the gun, flash hider, steam-condensing device, and asbestos mittens. He attaches the flash hider and steam-condensing device to the gun.

No. 3 secures one box of water, one box of ammunition, and a carrying sling.

Nos. 4, 5, 6, 7, and 8 each secures two boxes of ammunition and a carrying sling.

b. Ammunition and water are first unloaded from the ammunition cart. Additional articles of equipment which may be ordered carried for the accomplishment of a particular mission are secured and carried by squad members in accordance with a prearranged plan. If under enemy observation or fire, carts move to the nearest available cover unless otherwise directed.

c. To return the equipment to the carts, the command or signal **On carts** is given, at which the carts move up to the vicinity of the squad and the equipment is replaced on the carts.

13–73. To form squad column.—To form squad column from any formation, the command or signal **Squad column** is given. The petty officer moves in the direction designated for deployment, followed in numerical order by the rest of the squad. Carts follow in rear of the last number of the squad unless otherwise directed.

The squad re-forms on the petty officer in the original formation at the command or signal **Assemble.**

Fig. 199.—Example of squad with men staggered

13–74. To form deployed line.—To form deployed line, the squad being in any formation with equipment removed from carts, the command or signal **As skirmishers** is given. The squad leader moves in the direction designated for deployment. Nos. 1, 2, 3, and 4 in the order named place themselves on the left of the squad leader with the proper interval. Nos. 5, 6, 7, and 8 place themselves similarly on the right of the squad leader. (Fig. 200.) No attempt is made to dress on line with the squad leader. The squad re-forms and forms squad column from deployed line as described in paragraph 13–73.

Fig. 200.—Example of squad deployed in line

13–75. Extended-order exercises for the squad.—*a.* The purpose of these exercises is to train the squad in the application of the mechanism of extended order and to instruct the squad in the utilization of ground and the handling of the gun equipment in accordance with simple assumed tactical situations.

b. The following points are to be brought out in these exercises:

(1) Speed in going into action from carts.

(2) Advancing over rough ground in various formations with and without carts.
(3) Selection, occupation, construction, and concealment of gun positions.
(4) Supply of ammunition and water.
(5) Posting and relief of sentries at gun positions.
(6) Relief of the gun squad.
(7) Practice at night.

13–76. Method of conducting extended-order exercises of the squad.—*a.* The instructor selects suitable ground, prepares a simple tactical situation embracing one or more of the points outlined in paragraph 13–75 *b*, and insures that the squad is properly equipped for the exercise. The squad is conducted to a position of readiness in the vicinity of the ground upon which the exercise is to take place. The instructor explains the nature and purpose of the exercise and outlines the assumed tactical situation. The squad then executes the mission which is implied in the statement of the tactical situation or which has been announced by the instructor.

b. Exercises involving such movements as approach to a firing position, going into action, construction, and concealment of gun position are made more instructive and interesting by detailing a part of the squad or other squads to watch the exercise from the assumed location of the enemy. The importance of skillful use of ground and cover and of the proper handling of gun equipment is thus emphasized and understood.

c. The real value of extended-order exercises lies in the critique given by the instructor following the completion of the exercise. The squad is assembled for the delivery of the critique. The instructor will pay special attention to the lessons learned in elementary and advanced gun drills. When the squad has failed to perform the exercise properly he will point out the causes of the failure and the probable results of such failure under real battle conditions.

13–77. Gun emplacements.—Since one of the primary objects of extended order is to facilitate the effective use of machine guns in action, instruction in the method of using and improving natural cover and the construction of simple firing emplacements will be taken up in connection with training in extended order.

13–78. Principles governing concealment of positions and construction of cover.—Concealment is properly sacrificed for shelter from fire only when the cover can be made bomb and gas proof. When gun emplacements are constructed, the natural appearance of the ground is altered as little as possible. Full advantage should be taken of the natural concealment offered by such accidents of the terrain as brush, grain, hedges, embankments, and houses. Positions that are to be occupied for any length of time will be concealed from both terrestrial and aerial observation. The following precautions will be observed:

a. The wearing of paths to and around the gun position will be avoided. If possible, gun emplacements are located near woods, existing paths, edges of thickets, furrows, and fields in order to guard against detection of the emplacement by aircraft. Guns may be sited under trees, provided the trees are not too conspicuous. Paths leading to the gun position are best continued beyond the emplacement to a wood, path, road, or dummy emplacement so that they will not appear to terminate at the position.

b. Dummy works are usually located at least 150 yards from the gun position and so that the gun position will not be in the line of fire directed at the dummy work.

c. If the site is grassy, the sod can well be removed and used later to conceal the work. Surplus excavated earth is removed to a dummy work or concealed.

d. Regular slopes, rectangular outlines, high profiles, and unnatural shadows are to be avoided. The emplacements are preferably screened by a camouflage net, grass, brush, or other material at hand which blends in color and shape with the natural appearance of the ground.

e. When possible the gun position is selected with reference to available natural cover for the personnel; for example, positions near ditches, steep banks, existing dugouts, cellars, and pits. Head cover is provided for emplacements that are to be occupied for some time.

13–79. Examples of simple types of gun emplacements and shelters.—Examples of the proper use of natural cover and the construction of gun emplacements and shelters are shown in Figures 201–205.

FIG. 201.—Roadside emplacement and shelter

FIG 202.—Emplacement and shelter in woods or orchard, using trees as screens from overhead observation

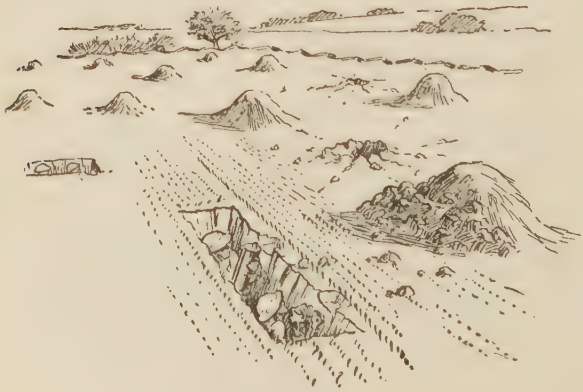


FIG 203.—Open field emplacement

Extended Order of the Machine-Gun Section

13–80. Duties of the section leader.—Since the section is led and controlled in combat by the section leader, the section leader occupies no fixed position during movement. He will generally be in advance of his section when it is acting alone. When the section is acting as a part of a larger unit, the section leader marches in rear of his section to prevent straggling and loss of equipment through casualties. When leading the section he selects routes of advance and reconnoiters for gun positions and targets. He keeps in touch with the platoon leader at all times.

13–81. Formations.—*a.* The normal extended-order formation of the section is line of squad columns with an interval of 30 paces between squads. The formation and interval are flexible and are changed to meet the requirements of the tactical situation and the proper use of ground and cover.

FIG. 204.—Emplacement in woods or edge of woods

FIG. 205.—Shell crater emplacement and shelter

b. In the unusual instances when the use of a deployed line is desirable, the section normally deploys with squads at an interval of 10 paces and slightly echeloned.

c. To facilitate control when moving at night or through woods, intervals and distances are decreased within the limit of visibility. The usual formation is a column of squad columns with shortened distances.

13–82. To deploy the section.—To deploy the section from any formation the section leader indicates the formation desired, the direction of deployment, and, if necessary, the base unit and the intervals and distances if other than normal. Squad leaders deploy their squads and conduct them to their proper position in the deployed formation. Example: The section being in close line to form the section with squads in squad column formation echeloned, facing

to the front. The section leader commands: 1. **Squad columns echeloned, first squad, base squad;** 2. **MOVE OUT.** The base squad deploys in the designated direction. The other squad is deployed and led to a position 30 paces to the left of the base squad so that the head of the squad is approximately on line with the last man of the base squad.

13–83. Exercises in extended order.—*a.* The purpose and scope of the exercises for the section are the same as in the exercises for the squad. In conjunction with the training in extended order, practice is to be given in proper designation and division of targets and in fire orders.

b. As the section is the basic fire unit and often acts when widely separated from other units of the company, extended-order exercises will be practiced by sections as soon as the squads become proficient in their duties as a gun team.

Extended Order of the Machine-gun Platoon

13–84. Duties of the platoon leaders.—*a.* The platoon leader determines the time and method of the deployment of the platoon, reconnoiters the route of approach, assigns the general direction of march, and selects the initial firing positions for the platoon. After the extension has been made, he provides for the supply of ammunition, water, and oil; disposes of the carts; issues the necessary fire orders; controls the fire of the platoon; determines the time and method of advance to successive firing positions; maintains communication with rifle units which the platoon is supporting and with the machine-gun company commander; and, when ordered or necessary, places his sections for the defense of the ground gained.

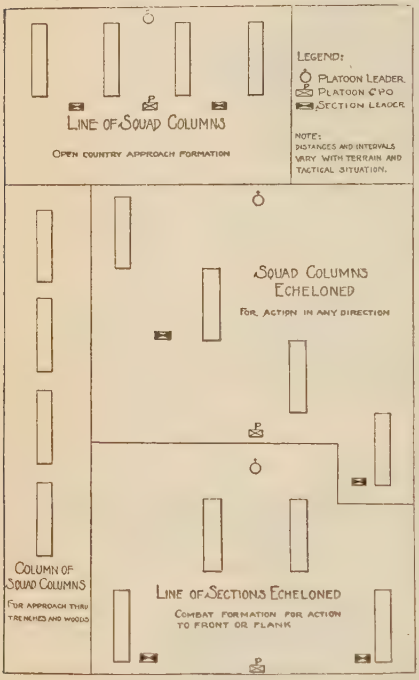


FIG. 206

b. The platoon leader does not remain in a fixed position with respect to his platoon but goes wherever his presence is required. During movement he is generally on the side of the platoon toward the enemy. When the platoon is in action, he occupies a position from which he can observe the effect of fire and from which he can control his sections. The platoon c. p. o. leads the platoon when the platoon leader goes ahead on reconnaissance. When the platoon leader is within controlling distance of the platoon, the platoon c. p. o. follows in rear of the platoon during movement and insures the orderly advance of the platoon.

13–85. Formations.—The platoon deploys in the same manner as prescribed for the squad and section. No fixed formation will be adhered to. The platoon deploys in column of squad columns, line of squad columns, and echeloned formations with varying intervals and distances, depending on the nature of the ground, the fire of the enemy, and the requirements of the tactical situation. Formations, intervals, and distances are modified from time to time during the advance in order to make the maximum use of defiladed approaches. The platoon never advances with squads deployed in line abreast of each other. When the platoon advances by successive movements of subdivisions, one section remains in firing position while the other is led forward to a new firing position by the platoon leader. The rear section comes up when the leading section has occupied the new firing position or when ordered by the platoon leader.

13–86. To deploy the platoon.—The platoon leader indicates the formation desired, direction of deployment, intervals and distances required if other than normal, and in addition he announces the base unit if such is necessary. Section leaders deploy their sections. The personnel of the platoon headquarters join the platoon leader.

13–87. Exercises in extended order.—All the points covered in the extended-order exercises of the squad and section will be covered in platoon training. Special emphasis will be given to deploying quickly and silently, both by day and by night, from all formations, changing formations to meet new conditions, orientation and marching by compass, occupation of firing positions, advance by alternate sections, and the maintenance of communications and supply.

Section IV.—MACHINE-GUN FIRE—DIRECT LAYING

13–88. The light Browning clip holds 20 rounds; the Benet clip, 30 rounds; the Lewis magazine, 47 rounds; the Colt, Marlin, Browning heavy, and Vickers belts hold 250 rounds each. In any type of machine gun, it is of advantage (except at dense targets at close range—say inside of 200 or 300 yards) to fire **bursts** of 5 to 30 rounds, depending on the conditions; checking the aim between bursts. The increased accuracy and steadiness more than compensate for the few seconds lost.

Direct Laying, General

13–89. Use.—In direct laying the location of the target must be visible to the gunner. The gun is laid in direction and elevation by means of the sights, the gunner manipulating the elevating and traversing mechanism so as to obtain a line of aim on the target. Direct laying differs from indirect laying in that the line of aim from the gun to the target is not obstructed by a mask, such as hills, woods, smoke or darkness.

13–90. Advantages.—*a.* Direct laying possesses distinct advantages over indirect laying. The location of the target being visible, the guns can be more quickly and easily laid on the target. Fire can be observed and adjusted to obtain the maximum possible fire effect. Rapidly moving targets can be engaged and followed with fire owing to the ease with which the cone can be shifted. Indirect laying is usually ineffective against rapidly moving targets, the direction of whose movement is not restricted. Direct laying is therefore normally employed against such targets as aircraft and mounted troops. Tracer ammunition, which outlines the cone, enables the gunner to place his fire on fast-moving targets without reference to the sights.

b. When direct laying is used the number of hits to be expected from the expenditure of a given amount of ammunition is considerably greater than when indirect laying is employed.

c. Guns employing direct laying are usually in such position that the gunner can see the movements of friendly troops. This condition facilitates closer support by means of overhead fire and enables the machine-gun units to keep in closer touch with the needs of the rifle units which they support than is the case with indirect laying.

13–91. Disadvantages.—*a.* The most serious disadvantage of direct laying is the difficulty of securing concealment and cover for the guns. It is probable that when the gunner can see the enemy the enemy can also see the gunner. An enemy on the defensive will, moreover, have the advantage of better concealment and cover, whereas troops in the attack are more or less forced to disclose their positions and movements. Muzzle blasts, steam, and the unmistakable sound of firing tend to reveal firing positions, unless proper measures are taken to minimize these unfavorable characteristics.

b. Another disadvantage of direct laying as compared with indirect laying is the relatively greater difficulty of controlling the fire of several guns and keeping up the supply of ammunition and water. Batteries of guns organized for indirect laying are generally located so that control and supply are greatly facilitated.

13–92. Conclusions as to the value of direct laying.—The possibility of observing the target and the effect of fire and the consequent simplicity of fire adjustment give to direct laying a relatively greater efficiency than that possessed by indirect laying. Taking into consideration the number of casualties inflicted upon the enemy within a unit of time with a given ammunition expenditure, it may be laid down as a general rule that fire with direct laying is much more effective than fire with indirect laying. It is the normal type of laying employed in battle. It should always be used in preference to indirect laying when a practicable choice exists between the two types of laying. However, indirect laying should supplement direct laying whenever there is a possibility of the failure of direct laying owing to smoke or darkness masking the target.

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13–93. General classification of ranges.—*a.* Ranges are classified as follows:

Close, under 700 yards.
Mid, from 700 to 1,200 yards.
Long, from 1,200 to 2,000 yards.
Distant, over 2,000 yards.

13–94. Methods of range determination.—*a.* Ranges may be determined by any one of the following methods:

(1) Estimating distance by eye.
(2) Range-finding instruments.
(3) Fire for adjustment.
(4) Taking the range from a map.
(5) Obtaining it from other units.
(6) Measuring the range directly on the ground.

13–95. Fire for adjustment.—*a. Methods of executing fire for adjustment.*

(1) When observation is good, the gunner opens fire at the estimated range; rolls the strike into the target by means of the elevating mechanism; sets the rear sight so that the line of sighting is on the corrected strike on the target; notes the sight setting on the rear sight; takes account of the zero of the gun and notes or announces the range to the target.

(2) When the ground in the vicinity of the target for any reason gives no observation or when it is desired to surprise the target with fire, the gunner may adjust on a point which does offer observation, the same distance away as the target, by proceeding as explained in subparagraph *a* (1). At the proper time the gunner swings his gun on the target.

(3) When engaging targets on ground which rises or falls perpendicularly to the line of fire, the gunner fires a burst and, without changing the laying of the gun, sets the rear sight so as to secure a line of aim on the burst. He then lays on the target; notes the sight setting on the rear sight; takes account of the zero of the gun and notes or announces the range to the target.

b. Fire for adjustment is dependent upon observation of strike. It will be most successful under conditions of good visibility (bright days) and a loose, dry soil. It becomes ineffective or impossible in poor light or wet ground or in brush, undergrowth, and woods.

c. Fire for adjustment is usually unnecessary at ranges under 700 yards. At close ranges, fire for effect is opened at once and accurate adjustment is secured while firing. Fire for adjustment should not be employed against rapidly moving targets and those which can evade fire for effect during the pause for observation and correction. Such targets are infiltrating skirmishers, mounted scouts, small columns, and groups near cover.

d. Against positions such as woods, trenches, or other organized areas fire for adjustment should be employed. It should be the rule to employ fire for adjustment on very practicable occasion when its use promises a more efficacious fire effect.

e. It must be borne in mind that fire for adjustment may remove the element of surprise and may cause a betrayal of position and intention. Therefore in the attack, if the infantry is not prepared to advance, if may be advisable to postpone fire for adjustment until just before the forward movement. On the other hand, if machine guns are to perform preparatory fire, fire for adjustment may be opened early.

f. Bursts may be long enough to insure observation. On dry soil 6 to 10 shots may suffice; ordinarily 20 to 30 are required. On wet ground, in tall grass, in woods, or on house roofs more may be required.

Classes of Fire

13–96. Effective beaten zone (E. B. Z.) is the horizontal area within which 75 per cent of the shots, so fired, fall. It is described at any range, by giving its **depth** (measured in the plane of fire) and its **width** (laterally or perpendicular to that plane), for that range.

13–97. Fixed fire.—*a.* Fixed fire is that fire in which the beaten zone is not artificially increased in width or depth by traversing or searching. The elevating and traversing mechanism may be clamped so as to limit the dispersion of fire.

b. Fixed fire is employed against small targets, such as machine guns definitely located, when it is possible to determine the range accurately. A knowledge of the properties of the beaten zone at various ranges will indicate when this type of fire can be successfully employed. The depth of the beaten zone must be sufficient to compensate for the probable error in range determination and must also include the target. Fixed fire may be successfully employed on small

columns, groups of men, areas, bridges, embrasures, and on moving targets whose direction of movement is restricted to roads, defiles, and trenches. When engaging such moving targets the gun is laid on an aiming point in advance of the target and fire is opened just before the leading element reaches the aiming point. Fire is continuous as long as any portion of the target remains in the zone of fire. The point of aim is moved ahead of the target as often as may be necessary.

c. Fixed fire, because of the resulting compactness of the beaten zone, is also employed to facilitate observation of the strike of the bullets. This class of fire is therefore useful when beginning to range on a target or when pointing out the location of a target to neighboring units.

13–98. Searching fire.—*a.* Searching fire is fire distributed in depth by successive changes of elevation of the gun. The traversing mechanism is usually clamped in order to limit the dispersion in width. Changes in elevation are made by manipulating the elevating mechanism.

b. Searching fire is employed against deep targets such as columns and trenches taken in enfilade. At lone ranges, particularly when the range is not exactly known, single guns must do some searching in order to be sure of hitting the target. Fire may be continuous while searching. Ordinarily, searching fire of from 10 to 50 rounds is delivered after each 2-mil change of elevation.

c. Targets moving toward the gun are engaged by opening fire upon their near end and searching up. Targets moving away from the gun are engaged by opening fire at the far end and searching down.

d. Searching fire is employed when firing for adjustment in order to roll the strike into the target.

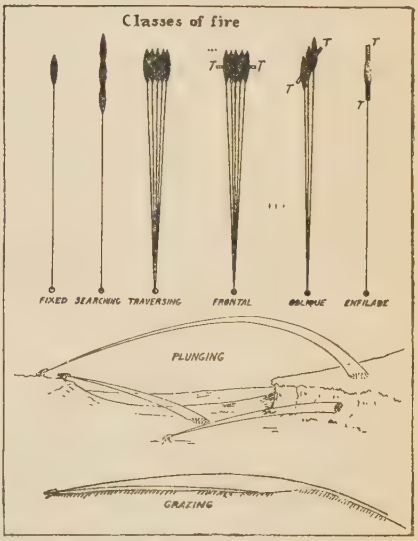

FIG. 207.—Classes of machine-gun fire

13–99. Traversing fire.—*a.* Traversing fire is fire distributed in width by successive changes in direction of the gun.

b. It is used to engage lines, trenches, edges of woods, and areas presenting frontal targets. It may be used to engage oblique targets, when the difference in range to the near and far ends is not greater than the depth of the effective beaten zone. To engage such an oblique target, a sight setting at a range midway between the ranges to the far and near ends of the target is used and the gun is laid on any part of the target.

c. At close range on moving targets, which may change direction rapidly, continuous traversing fire (swinging traverse) may be delivered. Against positions, against stationary personnel or at long ranges, fire is delivered in successive bursts by "tapping" or mechanical traverse. The time element, range and mobility of the target will indicate the proper method to use.

d. In firing against stationary targets whose width can be determined in advance, the limits of traverse may be set off by means of the traversing stops. At ranges over 700 yards, swinging traverse on thin lines of skirmishers will not give results commensurate with the ammunition expenditure. Such targets are engaged by "tapping" or mechanical traverse employing small bursts of from 10 to 20 rounds. This change of direction is made 2 mils at a time in order to insure lateral overlapping of the beaten zone from successive bursts. Both searching and traversing may be employed on oblique targets and on area targets such as woods, fields, and positions when it is desired to deny them to the enemy.

13–100. Frontal fire.—*a.* Frontal fire of machine guns is that fire in which the cone strikes approximately at right angles to the long axis of the target. This class of fire is least effective because full advantage can not be taken of the depth of the beaten zone.

b. It is employed against wide targets such as line of skirmishers, trenches, or edges of woods, the long axis of which is perpendicular to the direction of fire.

13–101. Oblique fire.—Oblique fire is that fire which strikes the target obliquely to its long axis. It is generally more effective than frontal fire because better use is made of the depth of the beaten zone. When the length of the beaten zone is sufficient to compensate for the difference in range between the near and far ends of an oblique target, traversing fire is used to cover the target. Otherwise some searching fire is used in conjunction with traversing fire.

13–102. Enfilade fire.—Enfilade fire is that fire in which the long axis of the target coincides with the long axis of the beaten zone. It is the most effective type of fire. Columns approaching the gun and lines engaged from a position on their flanks are said to be taken in enfilade. Troops taken in enfilade at short ranges are ordinarily annihilated. Enfilade is secured by proper choice of gun positions.

13–103. Plunging fire.—*a.* Plunging fire is that fire in which the angle of fall of the bullets with reference to the slope of the ground is so great that the danger space is approximately equivalent to the beaten zone. At the closer ranges plunging fire results from delivering fire downward from high ground onto such ground as lies nearly at a right angle to the cone. Such fire may also result against ground which rises sharply to the front with respect to the position of the gun. At the longer ranges fire becomes increasingly plunging as the angle of fall of the bullets becomes greater.

b. In the defense, positions should be chosen so as to avoid plunging effects. In the attack, plunging effects allow closer support to advancing riflemen.

13–104. Grazing fire.—*a.* Grazing fire is fire which is approximately parallel to the ground and does not rise above the height of a man standing.

b. A band of fire is a form of grazing fire. A *band* of fire is that fire in which the danger space is continuous from the muzzle of the gun to the point of impact for men in an upright position. Bands and cones which interlock across the front of a position form a *belt* of fire.

Targets and their Relation to the Fire Effect of Machine Guns

13–105. The moral and physical effect of machine-gun fire.—The moral and physical effects of machine-gun fire are greatest when the fire is delivered with great volume at close ranges, with surprise effect and in enfilade. The physical effect may often be increased by anticipating the probable actions of the enemy after the opening of fire; for example, if fire is delivered on a column which is near cover, such as the edge of woods, it may be expected that the enemy will seek this cover. If the machine gunner, anticipating the action of the enemy after fire is opened, shifts to the edge of the woods and lays down a band of fire so as to deny entrance to the wood, he will inflict additional casualties on the enemy as they attempt to gain cover, thereby increasing the physical effect of the fire. The moral effect of fire is greatest when it causes great losses in a short space of time or is of such accuracy and intensity as to cause the enemy to have no thought except that of self-preservation. Fire is successful when it causes the enemy to abandon his purpose.

13–106. Favorable machine-gun targets.—Favorable machine-gun targets are deep and dense. Groups of the enemy that bunch together and columns or lines taken in enfilade present the most favorable targets for machine guns. It must be borne in mind that ordinarily the position of the target with respect to the gun, rather than the shape of the target, will determine its vulnerability to fire. For example, a skirmish line engaged by frontal fire is a poor target, whereas if engaged from a position on the flank it may be a good target. The greater effective range of the machine gun as compared with the rifle makes it possible to engage targets which are unfavorable for rifle fire. As the enemy will never knowingly present deep targets, it must be expected that deep targets will usually be obtained by skillful selection of positions.

13–107. Unfavorable machine-gun targets.—The machine gun has little or no destructive effect against matériel. It is usually ineffective against tanks or artillery in position but may under favorable circumstances immobilize matériel which is animal drawn or served by men not protected by armored shields. Hostile machine guns, although unfavorable targets, may be effectively engaged and put out of action or at least compelled to change position. Fire should preferably be directed against personnel or against areas to be denied to the enemy. When the enemy assumes any formation which presents a frontal target with wide intervals between men he is least vulnerable to machine-gun fire. In practice the machine gunner will often be forced to engage unfavorable targets. The problem of the machine gunner is to accomplish the maximum possible results on any target most economically and effectively.

Unremunerative targets such as scouts, observers, small patrols, and the like should not be engaged unless their activity is not suppressed by rifle fire and unless such suppression is of particular importance.

Fire Distribution

13–108. Importance of proper fire distribution.—Fire, to be effective, must be distributed over the entire target. Improper distribution results in gaps between beaten zones and allows a part of the enemy to escape or use its weapons unhindered by our fire. The distribution of machine-gun fire, due to the compactness and density of the sheaf, is of special importance, inasmuch as without proper distribution ammunition will be wasted by throwing too many bullets into a part of the target, while the remainder of the target is untouched.

13–109. Methods of engaging frontal targets.—*a.* Most battle-field targets, particularly in attack, require some traversing. In exceptional cases these targets may be engaged by but a single gun, but ordinarily by two or more guns. It is desirable that two guns engage the same front. When such procedure is not practicable each gun must traverse its own part of the target.

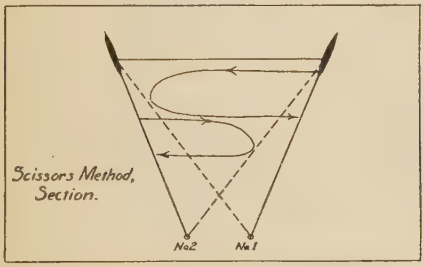

FIG. 208

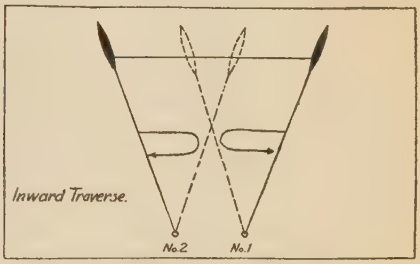

FIG. 209

Generally a single gun can not effectively traverse a frontal target that subtends more than 50 mils except at very short ranges.

b. There are several systems of fire distribution which are practicable and have stood the test of war. Any system used must be uniform. The following methods are suggested:

(1) A section preferably engages a target as shown in Figure 208.

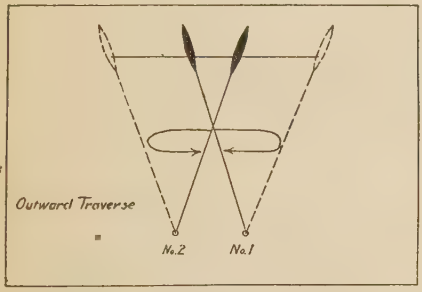

FIG. 210

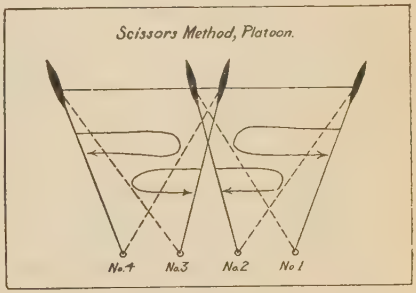

FIG. 211

Each gun lays outside the flank of the target to its front and traverses across and back, covering the entire target.

(2) When the target is too wide to engage as described above or is moving rapidly away from the gun's traverse as shown in Figure 209.

Each gun lays outside the flank and traverses across to slightly beyond the center.

(3) A target moving rapidly toward the guns, such as cavalry or a rush at close quarters, may be engaged as shown in Figure 210.

Each gun lays just beyond the center of the target and traverses (swinging traverse) outward to slightly beyond the flanks and back.

(4) For a front subtending less than 100 mils the platoon traverses as shown in Figure 211.

Each section scissors the half of the target to its front.

(5) A target subtending more than 100 mils is traversed as shown in Figure 212. Flank guns lay outside the flanks, No. 2 on the center of the right half and No. 3 on the center of the left half. Each gun traverses toward the center and slightly into the sector of the adjacent gun.

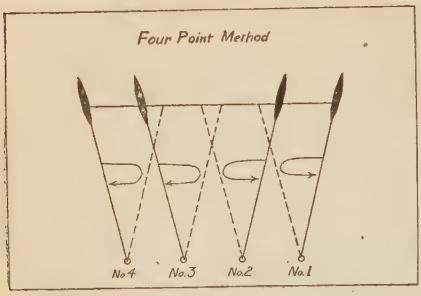

FIG. 212

c. Other methods of distribution may be required by circumstances. The methods described are usually applicable and form the basis of instruction and battle practice.

13–110. Methods of engaging enfilade targets.—*a.* The properties of the machine-gun cones are such that, at the close ranges and on level ground, the depth of the beaten zone ordinarily will be sufficient to cover effectively targets taken in enfilade. In such cases fixed fire should be used. When the ground is rising with respect to the direction of fire in such manner as to shorten the effective beaten zone, some searching will be required in order to secure proper fire distribution. When a sector or platoon engages a deep target, the variations in the angles of departure for the different guns employing the same sight setting, particularly when the barrels have not been zeroed, will cause the beaten zones to be at varying distances from the firing point. Such condition produces to some extent, the effect of combined sights which is discussed in paragraph 13–111. To engage a target of small depth when the range is accurately known, sections and platoons may lay on the target with the same sight setting and rely upon the combined beaten zone to cover the target effectively. Deep targets presented on the battle field will usually require the use of searching fire or combined sights.

b. To distribute fire of a single gun over a given depth of target the following methods may be applied:

(1) *Sight method.*—The gunner lays on the near end of the target with the sight setting to hit it. Then, without altering the elevation of the gun, he runs the rear sight up to the range to the far end of the target. He then searches up until the line of aim reaches the far end of the target or area. On level ground the near and far ends of the target will appear as the same aiming point. This method may be used to engage any target whose exact range is not known but which is estimated to be between two ranges.

(2) *Mil method.*—When the target lies on level or nearly level ground, from the fire tables determine the angle of elevation in mils for the range to the near end of the target, also the angle of elevation corresponding to the far end of the target. Subtract the first result from the last result. The remainder gives the number of mils to search in order to distribute fire over the target.

FIG. 213

Example:

Range to near end of target	1, 200
Range to far end of target	1, 500
Angle of elevation for 1,500	34. 8
Angle of elevation for 1,200	21. 3
Number of mils to search	13. 5 or 14

The gunner lays on the near end or far end of the target with the correct range to hit it and searches up or down mils. Knowledge of the angles of elevation for a number of key ranges will enable the trained machine-gun officer to make a mental calculation of the mils to search without reference to the fire-control tables. On vertical or nearly vertical targets, such as a steep slope, the mils to search may be measured directly by means of the mil scale in the field glass or the number of mils may be estimated or determined from observation of fire.

(3) A section may engage a deep target by searching as shown in Figure 213. The gunner of No. 1 gun lays on the near end of the target and searches up. The gunner of No. 2 gun lays on the far end of the target and searches down.

(4) A section may engage a deep target moving rapidly as follows:
(*a*) When the target is moving away from the gun both gunners lay on the far end of the target and search down.
(*b* When the target is moving toward the gun both gunners lay on the near end of the target and search up.

c. A section or platoon may engage a deep target by any of the methods described above, but normally a platoon or larger number of guns will engage a deep target by means of combined sights.

13–111. Combined sights.—*a.* Combined sights is a method of engaging a deep target by means of two or more guns which use the same aiming point with different elevations set off on the rear sights. This method may be used to engage deep targets or to insure hitting a target whose exact range is not known. Guns may be laid with combined sights and may fix, search, or traverse. The method also permits of surprise effect which might be lost when employing fire for adjustment. It is not advisable to use combined sights at close ranges.

b. The following factors must be considered when employing combined sights:
(1) Number of guns available.
(2) Length of the beaten zone (effective 85 per cent).
(3) Error in range determination.
(4) Length of target.

c. Since the length of the target and error in range are involved in determining the depth of ground to be covered they may be treated as one in determining this factor. Similarly, the length of the cone and the number of guns available are to be considered together since they determine the total length of ground which can be covered by fire. When the number of guns available is unlimited, the problem becomes that of determining how many guns are necessary in order that the unbroken, combined, effective beaten zone will cover the target. When the number of guns available is limited, the problem is that of covering the target by the most effective method with the guns at hand. Such action frequently results in gaps in combined effective zones which may seriously reduce the effectiveness of the fire.

d. Computation of the depth of the area to be covered involves the estimated depth of the target to be engaged plus the probable error in range estimation. If the target is shallow the probable error alone is considered. Thus, with a single machine gun as a target 1,000 yards away, according to the mean of the estimates of several trained estimators, the probable error includes an area extending 10 per cent of the range in each direction or an area extending from 900 to 1,100 yards from the gun. If a trench 100 yards long, whose range to its near end has been similarly estimated to be 1,000 yards, is to be enfiladed, the area to be covered with fire extends from 900 yards to 1,210 yards.

e. To determine the difference in elevation to use between successive sight settings, divide the depth in yards of the area to be engaged by the number of guns available to fire. The quotient to the nearest 25 yards is the required difference. If this difference is greater than the length of the effective beaten zone for the range, combined sights can not be used without some additional searching.

f. To determine the lowest sight setting to use, having determined the range to the near end of the zone to be covered, add to this range one-half the length of the effective beaten zone at this range. The resulting range will be the proper lowest sight setting.

g. Example of the application of above rules.—A platoon of four machine guns is assigned to cover a target 100 yards deep with the near end at a range of 1,000 yards. The probable error in range determination is 10 per cent. The area to be covered equals 1210—900, or 310 yards (300 for practical purposes). Three hundred divided by 4 equals 75, which is the required difference in elevation. This result is less than 100 yards, the length of the effective beaten zone at 1,000 yards. Therefore, combined sights are practicable, considerable overlap of the beaten zones of the guns being secured. The initial sight setting is 900 plus half of 100, or 950.

h. Application of combined sights.—Referring to the above example, the proper fire order would be: **Combined sights, 950 add 75.** The gunner of the base gun sets his sight at 950 and calls out **950 add 75,** the next gunner sets his sight at 1025 and calls out **1025 add 75,** and so on throughout the group. Theoretically, this fire will engage the target as shown in Figure 214.

i. The use of combined sights results in a considerable thinning out of the density of the combined beaten zones. Consequently, when combined sights are used to overcome a probable error in range, and when observation of the

fire has been secured, corrections are applied to guns whose shots are short or over so as to bring the fire of all guns on the actual target as soon as possible. Those guns which are judged to be already on the target will not be disturbed.

Overhead Fire

13–112. Machine guns are capable of delivering fire over the heads of friendly troops because of their fixed mounts and of the resulting small and reliable dispersion. The use of overhead fire increases the radius of action of the machine guns. The guns are not confined to positions on the line with the troops which they are supporting. Positions in rear which afford a fuller utilization of the important characteristics of the weapons can be selected. In the attack the use of overhead fire permits machine guns to continue the delivery of covering fire during the advance of the infantry.

13–113. *Definition.*—Overhead fire is fire delivered over the heads of friendly troops.

13–114. Use of overhead fire.—*a.* Overhead fire is primarily used to cover and support the advance of friendly troops in the attack.

b. It may also be used to execute fire of position over the heads of friendly troops in the defense.

FIG. 214

13–115. Overhead fire has a limited application and unless very carefully used is dangerous. It should not be used except by experienced machine-gun officers and if used the following precautions should govern:

Precautions.—(1) The range must be accurately known to secure proper safety angle and to insure hitting the target.

(2) Overhead fire is not used when troops are more than 1,800 yards from the gun because of poor observation and the probability that atmospheric conditions may cause "shorts."

(3) Required safety angles must not be lessened.

(4) A barrel that has fired tracer ammunition or 5,000 rounds of ball ammunition should not be used, because the barrel may have been injured so as to cause bullets to keyhole and fall short. (Excessive muzzle blast is an indication of a worn barrel.)

(5) The tripod must be firmly mounted to reduce vibration and resulting dispersion to a minimum.

(6) Badly worn tripods should not be used because of resulting increase in dispersion and the danger of the tripod collapsing by reason of worn serrations on the tripod legs.

(7) Water jackets must be kept filled while firing to prevent excessive heating of barrel which will cause shorts.

(8) Friendly troops should be informed when fire is to be directed over them so that they will have no apprehension regarding the crack of bullets over their heads.

(9) Depression stops should be used to prevent the muzzle from being accidentally lowered below limit of safety.

(10) Prepare indirect laying data, because observation may be obscured by smoke or fog.

Fire Control of Machine Guns

13–116. Fire control.—Fire control of machine guns implies the ability on the part of the leader to throw the fire of his guns upon the target, shift the fire of his guns from one target to another, open fire, regulate the rate of fire, and cease firing at will. Proper control can only be obtained when all ranks are disciplined and obedient to the will of the leader and have, moreover, the necessary technical skill to carry out the fire orders. Fire should not be opened without command except when the circumstances of battle make control by the leader impossible. Unless the leader controls the fire, much of its effectiveness will be lost through misapplication in engaging unimportant targets, or in neglect of important ones.

13–117. Methods of fire control.—*a.* The leader may use any method of control suitable to the situation. Verbal orders are employed either alone or in conjunction with signals when it is possible to control the unit by word of command. Written or verbal messages transmitted by messenger may be used to give fire instructions when guns are so far separated as to render impossible the direct control by word of command. When situations are foreseen and plans can be made to cover future events, such as when engaging targets on a time schedule or upon rocket signal, fire may be controlled by gun charts which prescribe the order and time of firing or by range cards which give the range and direction to key points within the field of fire.

b. The signals prescribed in "Drill and Combat Signals," chapter 8, which pertain to fire control should be thoroughly understood by all ranks of the machine-gun company. No. 2 of the gun squad must watch the leader for signals during action and transmit these signals in the form of an order to the gunner.

c. It must be understood that in battle it will often be impossible to control guns by verbal or signaled orders. In many instances control must be decentralized and the proper leader (c. p. o. or p. os)given only the mission. During training, in some maneuvers and certain exercises, special situations should be drawn which will require the guns to go into action without verbal orders of the larger unit leaders.

13–118. Adjustment of fire.—*a.* Observation of target and fire is continuous throughout the action. It is performed by all directly concerned with fire delivery. The gunner observes and corrects his own fire whenever possible. The squad leader takes post where he can observe the fire of his gun and communicate with the gunner and section leader. Section leaders take post so that they may observe the fire and communicate with their squads. The service of the gun and transmission of orders are facilitated by close grouping between guns in the occupation of a position.

b. Corrections are announced or signaled as up, down, right, or left so many mils and require a slight movement of the muzzle or cone of fire in the indicated direction. Corrections such as **Up 5, Down 2** are set off by the handwheel. Sight settings are changed by a command or signal indicating the new range.

c. When fire for effect is opened, errors in range or direction are corrected without pause while firing. The gunner, assisted by the squad leader, adjusts his fire on the target. When practicable the correction is estimated and checked by observed effect.

Target Designation

13–119. Preliminary training.—Before taking up the subject of target designation, machine gunners must be familiar with the military and topographical terms employed in designating targets; for example, crest, hill, cut, ridge, crossroads, right, left, flank, skirmishers, column, patrol. The seaman should also be instructed in the meaning and use of such terms as horizontal, vertical, above, below, rectangle, square, triangle, mil, yard, and pace. Before practical work in target designation is taken up, a thorough course in visual training and range estimation should be given. The seaman must be taught to use his eyes and retain mental pictures of what he sees. The effect of light, background, movement, and ground forms upon range estimation should be explained and demonstrated by simple exercises.

13–120. Importance of proper target designation.—A great amount of time and fire effect will be wasted unless the gunner is able to lay his gun quickly on the target selected by the fire controller. The misdirection of fire not only results in loss of time and waste of ammunition, but may endanger our own troops and encourage the enemy by the resulting inaccuracy. Such misdirection may also disclose our position without any return in casualties inflicted on the

enemy. Intelligent direction of fire can only be secured when all ranks are thoroughly proficient in the various methods of target designation.

13–121. Methods of designating targets.—Targets may be designated by any of the following methods:

a. Tracer ammunition.—Scouts point out enemy targets which they have discovered by firing tracers. Machine-gun runners may fire tracer ammunition from their rifles to point out targets to guns which have just come up.

b. Bursts of fire.—When observation of fire is good, machine guns which have located the target may fire bursts to indicate the location or flanks of an enemy target to neighboring machine guns.

c. Fire controller laying the gun.—When time permits, the fire controller may lay the gun on targets which are difficult to point out by verbal description or when other methods are not practicable.

d. Verbal description.—This is the usual method of designating targets.

13–122. Sequence of elements of a verbal target description.—*a.* The basic elements of a verbal target description are—

Range to target.
Direction of target.
Description of target.

b. A verbal description is given in the sequence indicated above. The range is first announced to enable the gunner to set the sight and then give undivided attention to the other elements of the description. If the gunner sets his sight after locating the target, confusion and possible loss of the target will result because it will be necessary for him to focus his eye from target to rear sight and back to target again. Announcing the range first gives the gunner an idea of how far away to look for the target, and assists him in locating it. In a verbal description, sufficient time should be allowed between announcement of the range and the remainder of the description, in order to allow the gunner to set the sight.

c. The direction of the target should be announced as the direction with respect to the position of the person receiving the target description. When the target is plain and unmistakable, the announcement of the direction may be omitted or the direction may be indicated by pointing. In describing obscure targets, it will generally be necessary to indicate the direction with respect to some well-defined object or feature of the terrain. This object or feature is called the reference point.

d. The target is the enemy personnel or an area at which fire is to be directed. Naming the target, for example, **enemy column, cavalry, woods,** assists recognition and indicates the type and rate of fire to employ. The target should be described as it will appear to the gunner, not as it appears to the fire controller. The latter's view through his field glass or from another position may be quite different from that of the gunner.

Fire Orders

13–123. Purpose of fire orders.—The leader, having selected the target and decided upon the method of engaging it, the rate of fire, and other features, issues his instructions in the form of a fire order. The fire order conveys the will of the leader to the gunner.

13–124. Method of delivery.—Orders must be accurate and brief and must describe the target as seen with the naked eye. They should be delivered in a sharp, clear tone, calmly and with an air of assurance and confidence. There must be sufficient interval between elements to permit the order to be understood and repeated.

13–125. Basic elements of a fire order.—*a.* A fire order contains three basic elements: Range, target, and commence firing. They are arranged in the sequence given and are always either expressed or implied in every fire order.

b. A complex situation requires a corresponding complex fire order, in which case it is necessary to enlarge each basic element by all the explanation required for a clear expression of the fire controller's will. The inclusion of unnecessary information results in confusion and wastes time when time is of the utmost value.

Gunners with an average amount of proper training need not be told in a fire order those things which are obvious. Nothing is gained by indicating a range that is already known. Merely naming or pointing at unmistakable targets will designate them more successfully than any amount of description. A trained gunner knows that a wide target may be traversed. He will traverse it by the normal scissors method, using a medium rate of fire at the mid and

long ranges and a rapid rate at close range. In a case where there is a question as to what method of delivery is the best or what rate of fire should be used, the fire controller must make the decision and include the information in his fire order. Such procedure is likewise necessary when a tactical situation, known only to the fire controller, demands methods differing from those apparently required by the situation as seen by the subordinates.

13–126. Examples of fire orders.—*a.* Many fire orders will consist of only the simplest expression of the three basic elements.

Example:

Range 900.
Hedge.
Commence firing.

Explanation: The order, or any part of it, is given verbally or by signal, as the circumstances require. The range is unknown to the gunner. It is given with the word **range** prefixed. When the target is clearly visible, simply designating the target by name insures recognition. The word **target** does not accompany the designation. Some form of fixed, searching, or traversing fire will be used, but the requirements of the target in that respect are so obvious that no order is necessary. Likewise the rate of fire is readily inferred. The simple command **Commence firing** is enough.

b. In very simple situations one or more of the basic elements of the fire order are omitted. Most of the information is readily inferred by the gunner or has previously been imparted by verbal instructions or range cards.

Example:

Commence firing (verbal or by signal).

Explanation: A clearly visible and unmistakable target has suddenly appeared at a point upon which the gunners have just been firing or the range is so close as to require no sight setting. The situation demands quick action. The *range* element and the *target* element are therefore omitted. When the target is unmistakable but the range is unknown, the range is announced as follows:

Range 850.
Commence firing.

c. The *range* element is modified when combined sights are to be used. **Combined sights** is substituted for the word **range** when the differences in elevation are to be applied by individual guns. Occasionally, when a platoon or larger unit is firing, the differences are allotted by section, and the command **By section** follows **Combined sights**. **Adjust** is further modification of the range element. Only a part of the unit firing is designated to carry out fire for adjustment. The designation of the unit is followed by the estimated range description of target and the command **Adjust.**

Example 1:

Combined sights.
1200 add 75.
Road cut.
Commence firing.

Example 2:

Combined sights.
By section.
1300 add 50.
Deflection, right 4.
Column.
Commence firing.

Explanation: The command **Deflection, right 4**, is a deflection for windage and is properly given along with the range.

Example 3:

First section 1200.
Road.
Adjust.
Commence firing.

The range having been determined, a new fire order is given.

All guns.
Range 1400.
Top window in church.
Commence firing.

Explanation: The range to the road is the same as the range to the church window. The road was used for adjustment of fire because it affords a better observation of strike. The new fire order is prefixed by the command **All guns.**

d. The portion of the fire order which deals with target designation will tend toward great length in some situations. Obscure targets require detailed description. Besides designating the positions of the targets, it will often be necessary to assign sectors.

Example 1:

Range 900.
Small pine woods on left of road.
First section, right.
Second section, left.
Commence firing.

Example 2:

Range 900.
Far end of canal bridge to left, 160.
Four points aim.
Commence firing.

13–127. SUSPEND FIRING. Fire is stopped and gun is set at safety, but all is left in readiness to continue the fire without change if the command **commence firing** is given.

13–128. CEASE FIRING. Fire is stopped, sights laid down, and the gun unloaded.

Auxiliary Aiming Points

13–129. If the target is poorly defined or difficult to describe, an auxiliary aiming point above or below the target may often be chosen, the shots being brought on the target by changing the sight elevation. This may be accomplished by several methods to be described; the principles involved are identical.

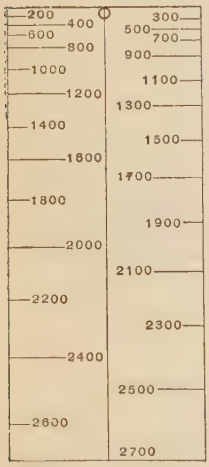

FIG. 215

13–130. Graticule method.—This is the easiest method. A graticule scale is necessary, which may be readily constructed as follows:

(1) Make a scale on a piece of cardboard or tin, with lines on it marked in the same manner, and at the same distance apart, as the 100-yard intervals on the rear sight. The scale so marked is used inverted, hence the figures must be made so as to be read that way (see fig. 215).

(2) Measure the distance from front to rear sight of the gun.

This is the distance at which the card must be held from the eye, and a knotted string will make it easy to get the distance correct.

(3) If, as is likely to be the case, the distance between sights is greater than the distance the graticule card can conveniently be held away from the eye, the distance may be reduced as convenient, and the card reduced in the same proportion; or the Springfield rifle sight may be used as a model, the sight radius being about 22 inches.

(4) The **method of use** is as follows: Hold the card vertically at the correct distance from the eye, and so that the target to be hit comes at the line marked with its range (e. g., the 1,100-yard line, if the target is 1,100 yards away). Then look for a prominent object to serve as an aiming point directly above or beneath the target. Say it is a hedge, and that it comes abreast the 1,900-yard line. Then with the hedge as aiming point, and the sights set as 1,900 yards, the target should be hit. The words "above" and "beneath" here refer to the angular distance away from the target, as seen from the firing point, and measured in a vertical plane.

13–131. Mil scale method.—(1) In this method a **mil scale** is used instead of the graticule, and the vertical angle from aiming point to target is measured in mils. This angle is added or subtracted (according to whether the aiming point is below or above the target) from the angle of departure for the range of target (taken from mil fire table), and the resulting elevation in mils is set on the sight, after reducing it to yards by means of the table. (Art. 13–132.)

(2) A mil scale may be easily constructed by using a piece of celluloid, cardboard or metal 6 inches long, graduated in fiftieths of an inch, with a hole in the center through which a string 20 inches long is passed. When the scale is held the string's length from the eye, each division on the scale equals 1 mil.

(3) Auxiliary aiming points to the right or to the left of the target may be selected and the proper amount of deflection may be set off on the wind gauge of the rear sight or on the tripod by means of the traversing mechanism.

13–132. Fire table for U. S. rifle, and machine guns, cal. 30, using 1906 Ammunition (2,700 f. s.):

Range	Angle of departure	Range	Angle of departure	Range	Angle of departure
Yards	*Mils*	*Yards*	*Mils*	*Yards*	*Mils*
100	0.7	1,100	16.8	2,100	62.7
200	1.5	1,200	19.9	2,200	69.2
300	2.4	1,300	23.3	2,300	76.1
400	3.4	1,400	27.1	2,400	83.6
500	4.6	1,500	31.1	2,500	91.4
600	6.0	1,600	35.5	2,600	99.9
700	7.6	1,700	40.2	2,700	108.6
800	9.4	1,800	45.3	2,800	118.2
900	11.6	1,900	50.7	2,900	128.2
1,000	14.0	2,000	56.5	3,000	138.9

13–133. Sight screw method.—Where the number of mils to one turn of the sight screw is known, the following method can be used:

Obtain mil reading between target and aiming point as before, set sights at range to target, and screw down (or up) sight screw as many mils as there are in the vertical angle between the aiming point and the target.

13–134. Sight screw table:

	Vickers mod. 1917, Mark IV tripod	Colt, 1917	Lewis	Benet Mercie
	Mils	*Mils*	*Mils*	*Mils*
One turn tripod elevating wheel, or mount elevating hand-wheel	43	63		
One turn sight elevating screw	1	1	7	1
Three notches sight elevating screw			1	

13–135. In using any of the above methods the observer should not be more than 6 feet above the guns, and in selecting an aiming point it must of course be visible from the gun. It is necessary to observe the fire in order to obtain effect.

13–136. Field glasses are sometimes fitted with an interior graticule or mil scale and are used in the same way.

13–137. Indirect fire, where the target is not visible from near the gun, will seldom if ever be used by landing forces. It has a limited application, requires great skill, is wasteful of ammunition, and its material effect is usually slight. It should, moreover, never be used except with guns having fixed platforms. Spotting is always necessary.

13–138. To employ indirect fire, the gun must be pointed for (1) **direction** and (2) **elevation.**

Direction is secured by a line of stakes located by an observer in rear of the gun, by compass, or by the methods given for artillery, if the instruments are available.

Elevation is secured by a pocket level or clinometer, and a contoured map if the elevation of the gun and target differs; or by similar method. For details see recent machine-gun publications.

13–139. To determine whether or not the trajectory will clear a mask between the gun and target: Lay the gun to hit the target. Without disturbing the laying of the piece, reset the sight to the range of the mask. The sheaf of fire will clear only if the line of sight clears.

Section V.—AUTOMATIC RIFLE (BROWNING), MODEL OF 1918

(Ordnance pamphlets 405 and 405A)

13–140. Care of the automatic rifle in the field.—*a.* The automatic rifle is so constructed that it will function properly even though dirt and sand have worked into the receiver. These should be removed as soon as possible to pre-

vent their getting into the chamber. To protect the receiver and the chamber from dirt, the bolt should always be kept in the forward position and a magazine in the magazine opening.

b. When advances are being made during the fire fight, the automatic rifleman, before each advance, should lower the magazine, allow the bolt to go forward, and then push the magazine into place. Although this method is slightly slower than rushing with the gun cocked, it will keep the gun in action much longer, since it reduces the probability of dirt getting into the chamber and the magazine.

c. During cessation of fire, the automatic rifleman should take every opportunity to clean and oil the gun thoroughly, paying special attention to the chamber.

d. At every cessation of fire, all empty magazines should be reloaded.

13–141. Sighting.—*a.* The rear sight on the automatic rifle consists of a large aperture in a small disk. It is graduated for elevation in even hundreds of yards. The sight is set by placing the index line on the rear sight slide opposite the index mark indicating the desired range. No wind gauge is provided. This necessitates holding to the right or left to compensate for wind.

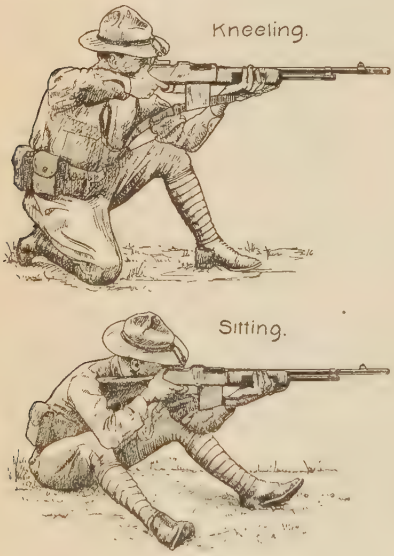

FIG. 216

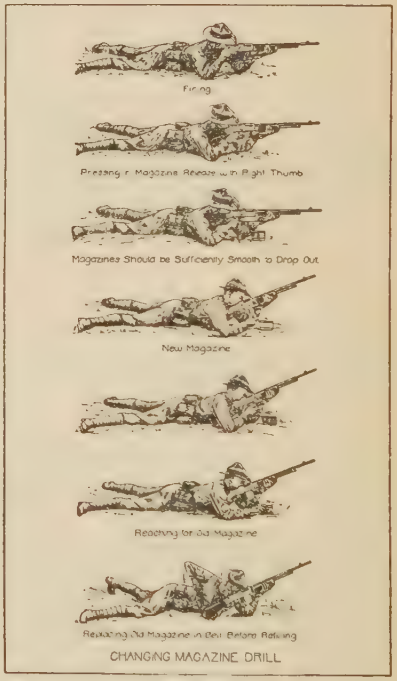

FIG. 217

b. The alignment of the sights alone, and on a bull's-eye in sighting, is as prescribed for the rifle. Because of the large aperture, a little difficulty may at first be encountered in centering the top of the front sight. As the eye becomes accustomed to the large sight it will be found that the front sight centers itself automatically. The firer must look through the aperture and not at it, and the eye must be focused on the target and not on the front sight. The aperture and disk will then appear somewhat blurred. The top of the front sight is aligned in the middle of the blur. Gradually the centering of the front sight in the aperture becomes automatic and ability to take quick aim is increased. The large rear sight is necessary in order to readily pick up the target, and keep it in view when firing rapidly.

c. Before all firing the front and rear sights of the automatic rifle should be blackened as prescribed for the service rifle.

13–142. Positions.—*a.* The automatic rifle will not be fired in the left-handed position.

b. In all firing positions the firer is taught to keep his eye as close to the rear sight as possible. Due to the lack of recoil the eye may be placed against the rear sight without danger.

c. The firer is taught to use the gun sling in all positions and at all times, for since the automatic rifle is heavier and is fired more rapidly than the service rifle, it will be correspondingly more difficult to hold steadily.

d. The positions for firing the automatic rifle are similar to those of firing the service rifle except in the prone position. In this position the body of the firer is placed directly behind the rifle and not at an angle. This is permitted by the shortness of the stock.

e. In the prone position with sand bag rest the gas cylinder tube is supported by the sandbag. The hand and forearm of the firer do not touch the sandbag. When first adjusted to the firer, the sandbag should be too high, that is, high enough so that the aim of the firer will not be lower than the top of the bull's-eye on the target. Further adjustment is made by pushing down on the barrel until the sights are aligned on the proper place on the target. Any tendency to have the sandbag too low must be promtly checked.

f. All positions must be so comfortable and steady that after each shot the automatic rifle will come back to the same point on the target. In practicing this, the firer takes position, sights on the target, closes his eyes and holds easily. On opening the eyes, if the position is correct, the gun is till aimed on the target. This is essential to maintaining a rate of fire of 40 to 60 shots per minute.

Section VI.—RANGE CARDS

13–143. Use of range cards.—*a.* The range card is a device for recording ranges to various points in a field of fire. It is used as a guide to the gunner. Range cards are used in attack and defense. The complete range card of the defense type shows ranges, deflections, and quadrant angles of departure to key points in the field of fire. The employment of range cards allows a decentralization of command without loss of control. Such use has special advantage in highly organized defensive positions when guns are separated by considerable intervals. Range cards should be prepared immediately upon occupation of defensive positions. The defense card forms a record for the use of relieving gun crews and is always considered as part of the orders for a position. Range cards should be prepared in advance for alternative positions and for battle positions of reserve guns.

b. Duplicates of the original range cards prepared for guns and sections during consolidation of a newly taken position may be sent back to the machine-gun company commander. With the addition of a few explanatory remarks such data form a valuable source of information as to the location and sectors of fire of the guns. Such early reports will be of great value to the machine-gun commander in that they show exactly what the guns can do in event of hostile action and indicate where coordination and rearrangement are necessary.

13–144. Preparation of range cards.—*a.* No fixed form of range card is prescribed. The defense cards shown in Figures 219 and 220 should be constructed because they are more informative than the simpler types shown in Figure 218.

b. Guides to construction.

(1) The gun position is marked exactly and named or numbered.

(2) Ranges should be obtained from map or range finder. Estimation will have to be resorted to in preparation of hasty range cards.

(3) All writing should be in block capitals.

(4) Ordinary ink or indelible pencil should not be used because it blurs when wet.

(5) Select an unmistakable landmark as a reference point and draw a heavy ray from the gun position toward the reference point. This line is used as an orienting or reference line from which deflection right or left is measured.

(6) Indicate landmarks or targets by conventional signs or drawings in perspective, and by naming them also, to prevent misunderstanding.

SIMPLE DEFENSE CARD

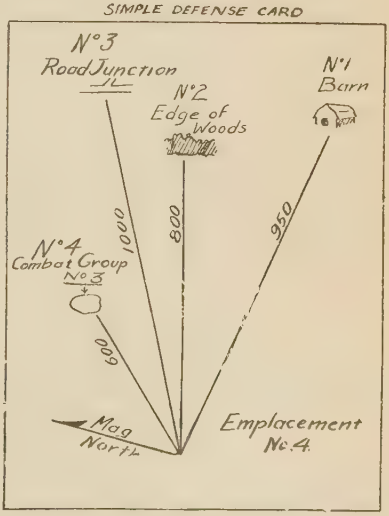

FIG 218

(7) Number targets from right to left. If the same target appears on cards in adjoining areas it should be assigned the same number on each card.

c. The completed defense range-card should be secured to a stake or board and placed in the gun position convenient to the gunner. It is advisable to provide some sort of waterproof covering for range cards. This covering should be capable of being quickly removed. (See fig. 221.)

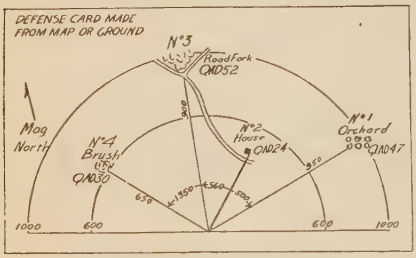

FIG. 219

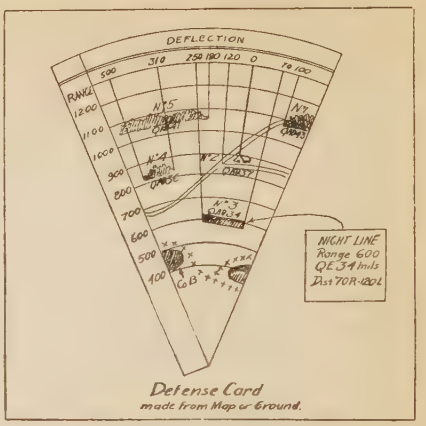

FIG. 220

13–145. Attack range cards.—*a.* Figure 222 shows a simple range card for use in attack. The ranges are taken from the point of departure or first firing position. The card may be prepared with the aid of a range finder or map.

b. The attack range card enables the gunner or unit leader to determine quickly the range to the enemy position at any time during the advance by interpolation between the measured ranges from the key points.

13–146. Defense range cards.—*a.* Figure 218 is an example of a simple range card for use in defense. Such cards may be gotten out in the first occupation of a position. They are replaced as soon as possible by the form shown in Figure 219, which gives the data for both direct and indirect laying.

b. Whenever possible defense cards are supplemented by panoramic sketches. Ordinarily the difficulties of construction will restrict their use for positions not under hostile observation.

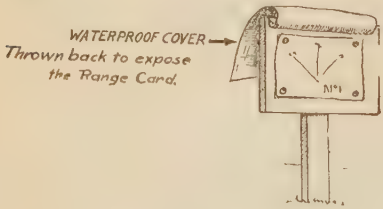

FIG. 221

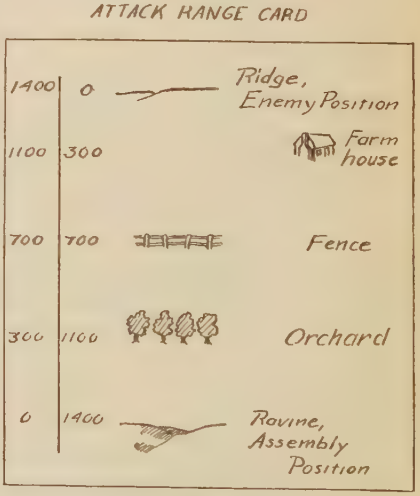

FIG. 222

c. Defense cards are often constructed from a map. Figure 220 shows such a card drawn on waxed paper with colored pencils. All landmarks are drawn in perspective and natural colors.

Combat Principles of the Machine Gun

For detailed instructions on the combat principles of the machine gun see Part III, "Combat Principles—Machine-Gun Section"; "Combat Principles—The Machine-Gun Platoon"; and "Combat Principles—The Machine-Gun Company."

In Part III are given instructions relating to reconnaissance, the selection and occupation of positions, the machine gun in attack and defense, withdrawal, rear guard, and outpost duty, etc.

Part II

Chapter 14

THE LANDING FORCE

Section I.—ORGANIZATION

14–1. Each ship, division, and fleet shall maintain a permanently organized landing force, consisting of infantry, artillery, machine-gun, and other units, as hereafter provided. The organization will be flexible, so that all or any part may be landed, at the discretion of the senior officer present.

14–2. The unit of organization is the platoon.—A landing force company, whether of infantry or artillery, should, if possible, consist of three platoons. For infantry, platoons should consist of six squads each; for artillery, of four squads each. Each company, whether of infantry or artillery, should have a squad of special details, which, when not combined in the battalions, muster and mess with the company.

14–3. The ship's landing force varies in size and composition, according to the type of ship. For a ship of the first rate it consists normally of two platoons of marines (infantry), one company of bluejacket infantry, two platoons of bluejacket artillery, machine-gun unit and special details. This constitutes a **ship's landing force**, but when landed as part of a fleet organization it is subject to reduction, due to combination of marines or artillery into separate units of those branches. When the nature of the service is such that artillery will not be required, the artillery platoons may be landed as infantry.

14–4. (1) **The battalion** consists of not less than two nor more than four companies. When, due to combination of marines or artillery into separate units, a ship's landing force would become reduced to one company, adjacent ships will be required to combine to form a full-sized battalion of four companies.

(2) **The regiment** consists of from two to four battalions.

(3) **The brigade** consists of two or more regiments.

(4) Whether serving as infantry or artillery the organization is identical.

14–5. The maximum force.—Where otherwise desirable and the number of men permits, the number of companies may be increased by adding additional companies of bluejacket infantry to each ship's force; but enough men shall always be left on board to care for the ship, to use the battery, and to move the engines as may be required by the existing conditions of weather or service. Not more than one-half of the combatant force shall be landed at any one time.

14–6. Whatever the plan of organization adopted for the division and fleet landing forces, it is important that it be made as nearly permanent as possible, complete in all its details, and that units be definitely assigned, in order that all concerned may be become familiar with their duties before the actual time when the landing force may be required. This is especially true of the detail of staff officers, and for the larger as well as the smaller units.

14–7. Marines.—For parades and ceremonies the marines will be placed on the right of the line in their battalion, regiment, or brigade, according to the method of organization. In actual operations on shore they will be placed where directed by the officer in command of the forces; and in mixed detachments or forces composed of seamen and marines serving on shore, the senior line officer of the Navy or of the Marine Corps shall command the detachments.

Marines will be employed as landing forces whenever the numbers present are adequate. In a mixed force the special training of marine officers and men will be utilized to the greatest practicable extent to increase the efficacy of the entire force.

The titles of brigade, regimental, battalion, and company officers, and non-commissioned officers of marines, shall remain unchanged.

Organization of the Staff

14–8. All military units larger than a company have headquarters and staffs. Their duties are both tactical and administrative.

14–9. The commander of a landing force concerns himself with the broad questions of strategy and military policy. He is assigned such a staff as is necessary for the discharge of his duties. The commander may detail additional staff officers when necessary, but a bulky staff implies a division of responsibility, slowness of action, and indecision, whereas a small staff implies activity and concentration of purpose.

14–10. Whatever its composition, the sole purpose of the staff is to assist the commander in his mission. The acme of staff service is reached when, under the direction of the commander, and with the minimum of friction, discomfort, misunderstandings, and loss for the units of the command, that mission is achieved.

14–11. (1) In order to provide the necessary command and staff service, every ship of the fleet will organize a staff for service with the landing force. Except for flagships, or where otherwise directed, the organization is that of a battalion staff. Their duties are restricted to service with their own landing force battalions, or the battalions of the landing force regiments. Division flagships provide also the additional details to complete a regimental staff. When the landing force battalion of a division lands independently, its staff is provided normally from the regimental staff. The brigade staff is similarly provided by the fleet or force flagship.

It will be noted that while some ships must organize various headquarters detachments, they are not, as a rule, required simultaneously, and the officers, petty officers, and men from the larger staffs afford material from which the smaller units are supplied.

(2) Battalion, regimental, and brigade commanders will be designated by the division and fleet or force commanders. Staff officers are similarly designated; this should be, as far as practicable, on the recommendation of their respective chiefs.

Duties of the Staff

14–12. The duties of the various members of the brigade staff are also performed, as far as they are applicable, by officers on similar detail in the regiment and the battalion.

When operating independently, or on detached service, the commanding officer of a regiment, battalion, or detachment performs the duties prescribed for the chief of staff with reference to the specific mission on which he is engaged.

14–13. **The chief of staff** is the senior assistant and military adviser to the brigade commander. He has general supervision over the instruction and training of the command and of its operations in the field.

He is responsible for the preparation of plans of operations, combats, and movements; the preparation of field orders and war diaries. (See arts. 15–29 et seq. and 19–39 et seq.)

He keeps the commander informed with regard to the strength, distribution, morale, movements, and reinforcement of the troops.

He is in charge of the relations with the civil authorities and inhabitants of the occupied territory.

He exercises control over the radio, telegraph, telephone, and cable communications, and the coding and decoding of messages and orders.

He organizes the intelligence and information service. Such officers and enlisted men as are suitable are detailed for this duty, and every effort is made to obtain reliable service from friendly civilians. He causes a daily report of all information received from the various sources relating to the intelligence service to be made for the information of the brigade commander.

He has supervision over the censorship of mails and other methods of communication, and over newspaper correspondents.

14–14. (1) **The adjutant** is senior assistant to the chief of staff.

He is in charge of the interpreters, guides, and translators.

He exercises supervision over the establishment of signal stations and wire and radio communication. He is assisted by regimental and battalion communication officers.

He is the medium of communication in sending and receiving flags of truce and any other communication with the enemy.

(2) The adjutant is responsible for the custody of all headquarters files and records.

He issues all routine orders, circulars, and memoranda.

He is the medium of communication between the commanding officer and all units of the command.

He causes the rosters for guard, police, and other duties (see arts. 16–5 et seq.) and consolidated reports of strength and distribution of the command to be properly kept.

He supervises the preparation of all letters and other official correspondence.

(3) The duties prescribed under paragraph (2) relate specifically to regimental and battalion adjutants. The adjutants of subordinate units do not perform the duties prescribed in paragraph (1), except such as relate to their duties as communication and intelligence officers under the brigade adjutant.

14–15. The communication officer under the supervision of the chief of staff shall organize and oversee the communication service, including radio, telegraph, telephone, cable, messengers, and visual signals.

Also, he shall arrange for the coding and decoding of messages and orders.

14–16. The supply officer is in charge of the pay of the personnel and general disbursements and the settlement of reimbursement claims. He is detailed to the service company and is in general charge of the distribution of rations and commissary supplies and of messing arrangements.

14–17. (1) **The brigade pioneer officer,** if one is detailed, is in charge of labor, roads, bridges, and the maintenance and operation of railways.

He has charge of surveys, preparation, and distribution of maps and organization of map-making details.

He has supervision over military engineering operations, the construction of fieldworks and lines, and demolitions.

He is in charge of all transportation facilities, and light and power plants.

He provides offices, quarters, forage, fuel, and water as may be required.

He makes provision for the ammunition supply, and keeps, for the information of the commanding officer, a report, showing amount of ammunition, tents, and other equipment on hand.

He provides equipment and camp equipage as may be obtainable from the reserve supply of the ships of the fleet, to supply any shortage that may occur in the landing force.

(2) Quartermasters (supply officers of subordinate units perform such of the above duties as are applicable. They supply the brigade supply officer with all information and assistance as necessary to aid him in the efficient performance of the duties assigned his department. Subordinate quartermasters (supply officers) are also the commissary officers of their units, and aid the brigade supply officer in the messing arrangements and ration supply of the command.

(3) When an **artillery liaison officer** is attached to the brigade staff, he may be assigned such duties relating to ammunition supply, including artillery ammunition, the supply and repair of field and machine guns and small arms, as do not interfere with his duties as adviser to the brigade commander on the employment and disposition of the artillery.

14–18. The force surgeon.—The senior medical officer attached to the landing force shall serve as force surgeon on the staff of the force commander. He shall act as adviser to the force commander on medical and sanitary matters. He shall be responsible for initiating recommendations for the promotion of health and prevention of disease.

The force surgeon shall have general supervision over all medical department activities.

The regiment is the administrative unit. Orders and mandatory instructions to the different medical detachments shall be forwarded via the regimental or unit commanders. This is not to be considered as limiting the force surgeon's prerogative of consulting and advising the medical officers on professional matters.

He shall recommend suitable means for the collection and evacuation of the sick and wounded and provide for proper hospitalization.

He shall be in charge of the force hospitals established on shore. He may delegate authority over routine hospital matters to the executive surgeon.

The force surgeon shall be furnished with a daily report of sick from the various tactical units.

He shall be notified immediately regarding the occurrence of any communicable disease.

He shall keep the force commander informed relative to the health of the command and the sanitary condition of camps and environs.

His general duties, unless otherwise specified, shall be similar to those prescribed for the fleet surgeon.

14–19. The force sanitary officer.—The assistant to the force surgeon shall act as force sanitary officer.

This officer is responsible for the inspection of the water and food supply. He shall be the survey officer for food unfit for consumption.

When there is no medical officer available for this duty the force surgeon shall act in this capacity.

14–20. The aides when not on duty directly under the brigade commander are assigned as assistants to the chief of staff and the brigade adjutant, respectively.

The aide in personal attendance on the brigade commander will keep the chief of staff informed of any contemplated movement of the brigade commander.

When orders or instructions are issued during the absence of the chief of staff, the aide in attendance will make a written copy of the order and send it without delay to the chief of staff.

14–21. The bg. c. p. o. and staff p. os. are the assistants to the staff and perform such duties as may be assigned them.

The bg. c. p. o., under the adjutant, has general charge and supervision over all the p. os. and men of the headquarters detachment.

14–22. The headquarters details for the marine battalions and regiment of marines are made from the Marine Corps personnel. Medical officers and members of the hospital corps of the Navy are assigned as for other landing force units.

14–23. The assignment of officers of proper rank for command and duties is as follows (marine officers are of corresponding rank):

Rear admiral,	Bg. c.	Lieutenant,	Rg. adj. Rg. com. off. Rg. q. m. Bn. s. o. Bn. sur. C. c.
Captain,	Bg. c. Chief of staff. Rg. c.	Lieut. (j. g.),	Bn. adj. Bn. q. m. C. c. Pt. c. Rg. or Bn. com. off. Aide.
Commander,	Chief of staff. Bg. s. o. Bg. sur. Rg. c. Rg. s. c.	Ensign or warrant officer,	Bn. q. m. Pt. c.
Lieut. commander,	Bg. adj. Bg. q. m. Rg. s. o. Rg. sur. Rg. s. c. Bn. c.		

An officer of the supply corps is detailed as brigade supply and commissary officer. When desirable, pay clerks may be detailed for similar duty with battalions. These officers are generally incorporated in the service company in large commands.

The Color

14–24. Only one color shall ordinarily be carried by each regiment. In a mixed force, where the artillery is not organized into a regiment, the color shall be carried by the infantry. In street parades, however, and when battalions are acting independently, each battalion may be permitted to carry its color. The term "color" is applied to the national flag if carried alone; the term "colors" includes the regulation regimental or battalion flag if the latter is carried with the national flag. (See chapter 6.)

Section II.—SPECIAL DETAILS

(See Part III, TR 420–180, Combat principles—The Service company, Infantry regiment. Also paragraph 4–30—the Headquarters company.)

14–25. (1) **The special details** accompanying a landing force comprise **ammunition party, pioneers, signalmen, cooks, ambulance party, and officers' servants.**

(2) Any or all of the special details may be massed in each battalion, regiment, or brigade under the proper staff officers in the service or headquarters company.

14–26. The organization of the special details is a matter of the first importance. The number of men assigned to these duties, and their equipment, depends largely upon the circumstances of the service in any case; it is impossible to anticipate all conditions and necessities in these regulations.

14–27. During an engagement, in order to reduce the number of ineffective men to a minimum, the messmen, servants, and others who are not actually engaged in their own legitimate duties shall be employed to reenforce the stretchermen. They should recover the arms and ammunitions of disabled men, and perform such other duties as the commanding officer may direct. Those who assist the stretchermen should lay aside their arms and wear the red-cross badge.

Pioneers

14–28. (1) The pioneers, consisting ordinarily of two men for every company landed, will carry as complete an outfit of intrenching and carpenter's tools as the conditions of the service and the facilities for transportation will permit.

When desirable, the pioneers may be supplied with explosives for demolition work. Sketching outfits may be added if the pioneers are qualified for map making.

(2) Circumstances must largely determine the duties of the pioneers in any case. They may precede the main body with the advance guard to clear away obstructions and entanglements and repair bridges and roads. In camp they may assist in constructing defenses and entanglements and making gun emplacements.

In retreat they may operate with the rear guard in blowing up bridges, buildings, and fortifications, in destroying guns, planting mines, and obstructing pursuit.

14–29. The pioneers are in charge of the brigade, regimental, and battalion quartermasters, who are responsible for their training, organization, and equipment. One petty officer is included with each detachment of eight pioneers landed. If formed into a company, the organization is the same as for infantry; the proper quota of officers and petty officers being detailed for duty with the pioneer company.

14–30. Electricians, locomotive engineers, and other special men who may be needed in some cases to take charge of electric plants or railroad property on shore, may be added to the pioneers. Such men are always available in a ship's company.

Signalmen

14–31. Duties.—Provision is made for **company** signalmen who constantly remain with the companies to which attached, and **headquarters** signalmen, which are attached to each battalion, regiment, and the brigade.

In addition to the duty of making necessary signals, these men should be able to take charge of telegraph and telephone lines when necessary.

14–32. Signal outfit.—Each signalman should carry hand flags for day signals, and the party should have the necessary night signal outfit. The following articles also should be supplied.

Compass.	Lanterns.
Binoculars.	Memorandum books.
Spyglass.	Message blanks.
Pencils.	Boat Book.

A pair of climbing irons will be of use to signalmen, who may obtain and communicate information by climbing trees.

14–33. A telescope of high power, mounted on a tripod, should be supplied if possible for the use of the headquarters signal stations of the regiments and of the brigade.

14–34. Radio outfits. A field radio set should be included in every landing force. It should always be included in each battleship battalion when landed. The brigade or regimental communication officer is responsible for their proper distribution and use in brigade and regimental operations ashore.

Ammunition Supply

(See Art. 19–195 et. seq.)

14–35. Spare ammunition.—In case a large supply of spare ammunition must be carried, special means should be supplied for its transportation, especially in hot climates. Native carriers or pack animals should be obtained, if possible. Poles about six feet long for each pair of carriers may be useful to sling a box of ammunition. (See par. 13–29.)

Commissariat

14–36. Cooks, messmen, and officers' cooks and servants will be detailed to the service or headquarters company, or as may be required.

14–37. In the field it will ordinarily be found most satisfactory to organize company messes. When desirable a p. o. is detailed as petty officer in charge of the mess; he is in general charge of the cooks and messmen. The first cook is responsible for the care, preservation, and cleanliness of the cooking utensils and mess outfit of the company.

The c. c. is primarily responsible for the proper rationing and serving of food to his company; every meal should be inspected either by the c. c. in person or by one of the junior company officers.

14–38. The brigade and regimental staff each have a separate mess. A battalion mess for the bn. c., staff and company officers, is maintained in each battalion; but company officers may, if desirable, have separate company messes.

When all the officers of a battalion have a single mess, company servants are attached, in addition to their other duties, to the mess and aid in the preparation and serving of the meals.

14–39. Staff petty officers, orderlies, and other details attached to headquarters, are evenly distributed among the company messes for rations.

When any special detail is organized into a separate company, such as a headquarters, service, pioneer, or machine gun company, it is rationed and messed as for a regularly organized company.

14–40. **Provisions.**—(1) The quantity and kind of provisions will depend upon the nature and length of service, distance from the base, and upon the probable supplies obtainable in the field. **A part or all of the Navy ration may be used.**

(2) The following limited table of rations is suggested as suitable for brief tours of duty on shore:

Articles per 100 Rations

	Pounds		Pounds
Hard bread	100	Coffee, roasted and ground	8
Corned beef [1]	75	Sugar	15
Beans, baked } [2]	45	Milk, evaporated, unsweetened	4
Tomatoes, canned }	75	Salt	1
Jam	9	Pepper	[3] 4

14–41. **An emergency ration** for two days' service may be issued to each man, and carried in the haversack.

14–42. **Cooking utensils.**—Boat stoves will be carried if practicable. They are not indispensable, however, as fireplaces can be built with ease. Kettles of different sizes are specially useful. Frying pans and broilers are very necessary. Cooking utensils must be kept scrupulously clean. When the force is to remain near the ship, or whenever transportation is available, an ample supply of utensils should be carried. Circumstances must govern in each case. The list of utensils furnished with the field range (Donavin type), Art. 15–38 indicates what articles may be supplied, when practicable.

A liberal supply of matches should be carried. They should be stowed in tight tin boxes kept free from moisture, and should be expended economically.

14–43. **Water allowance.**—Two quarts per day is a short allowance for cooking and drinking. A gallon per day is a reasonable allowance, and when there is a plentiful supply the men should be allowed about 5 gallons per day for drinking, cooking, and washing. (See par. 23–52.)

14–44. **Cold tea and coffee.**—When authorized, the men may fill their canteens with cold tea or coffee.

Ambulance Party—Hospital Staff

14–45. The medical department shall consist of all medical officers, dental officers, pharmacists, hospital corpsmen, nurses attached to the landing force, patients on sick list, and stretcher bearers assigned for care and transportation

[1] Or corned beef, 50 pounds; bacon, 25 pounds.
[2] Or 125 pounds of potatoes, Irish or sweet; or 25 pounds of tomatoes, or other vegetables, and 100 pounds of potatoes.
[3] Ounces.

of the sick and wounded. The stretcher bearers are members of other branches of the naval service regularly assigned and instructed for specific duty in the care and transportation of wounded.

More detailed instructions for the medical department will be found in chapter 23.

Section III.—ARMS AND EQUIPMENT

14–46. Officers.—At parades and ceremonies and at ordinary infantry and artillery drills on shore, officers will wear swords only. **At practical exercises with the landing force on shore** officers will carry pistols and binoculars and omit the sword.

14–47. Petty officers.—The bg., rg. and bn. sf. p. os., c. p. os., color bearers, headquarters signalmen, and buglers will wear pistols at all drills and ordinarily on active service on shore.

Sergeants major of marines and first sergeants of marines in charge of companies will ordinarily be armed with noncommissioned officers' swords in lieu of pistols, except at practical exercises with the landing force or when on active duty in the field.

14–48. Special details.—All the special details, except the ambulance parties, will, ordinarily, be armed with the rifle.

14–49. All members of the medical department, including stretcher bearers, will not ordinarily be armed or perform military duties in violation of International Conventions. They will wear the Red Cross brassard on the left arm.

Against a savage or uncivilized enemy, members of the medical department, including stretcher bearers, may be armed and when so armed shall not wear the Red Cross brassard.

Medical officers may wear side arms at parades and reviews, but not on active duty against a nation who is a signatory to the Geneva and Hague Conventions.

Infantry and artillery companies are armed with rifles, and two machine guns per company are also carried, when necessary, by designated companies. When artillery companies are permanently organized, and where duty away from the piece is improbable, the gun squad may be armed with the pistol.

14–50. Boat keepers will be armed with rifles.

14–51. Servants.—If armed at all, servants will carry pistols. The commanding officer will give directions, as circumstances may require.

14–52. Fully equipped.—When fully equipped, officers will carry:

Pistol and ammunition.
Canteen.
Haversack (containing mess gear).
Field glasses.
Watch.
Whistle.
Pocket compass.
Blanket roll (containing extra clothing).
Map case (maps, pencils, blanks, notebook, etc.).
First-aid package.

The articles of equipment will be carried as follows:

(*a*) Pistol in holster, the holster being attached to the belt at the point of the right hip, with the lower end of the holster strapped to the right leg.

(*b*) Extra magazine clips will be carried in pockets just to the left of buckle.

(*c*) Canteen attached to the belt just to the right of the middle of the back.

(*d*) Haversack attached to the belt with the right snap hook attached at the middle of the back, the other snap hook as far to the left as necessary to secure a good fit.

(*e*) First-aid package attached to the belt just to the right of the buckle.

(*f*) Field glasses in case with strap over right shoulder and under belt, bringing the case close up under the ammunition pockets to left of buckle.

(*g*) Whistle on a lanyard around the neck. Pocket compass in any convenient pocket.

(*h*) Map case (containing maps, blanks, pencils, etc.), on a strap over the right shoulder, bringing the case over the left hip; to be worn when the nature of the duty so requires. When the map case is not carried, pencils, paper, blanks, etc., may be carried in the haversack.

(*i*) The blanket will be rolled, secured with tie-ties, and placed on the right shoulder with the ends of the roll fastened together under the left arm. When

so desired the poncho may either be worn or rolled outside the blanket for protection. The following articles will be carried in the blanket roll:

1 pair shoes.
2 pairs socks.
1 suit underwear.
1 shirt.
1 trousers.
Toilet articles.

14–53. Lightly equipped.—When lightly equipped the blanket roll and the haversack will be omitted.

14–54. Extended operations.—When more extended operations are contemplated (three to six days), officers will take ashore with them the regulation pack complete. In order to permit greater freedom of movement on the part of officers, the pack will seldom be carried by the officer himself unless no other transportation is available. Officers' packs will, as a rule, be carried with the company, battalion, or regimental stores. Orderlies may be detailed to care for them. (See par. 13–29.)

(2) When operations are expected to cover a period greater than one week, or landing forces are to operate from a base ashore, either on the coast or in the interior, the following baggage allowances are authorized, such baggage to be transported with the supply column of the organization to which the officer is attached and to be plainly marked with the officer's name and organization:

(*a*) Company officers and battalion staff: 1 bedding roll, 1 clothing roll, 1 trunk locker, not to exceed 6 cubic feet outside measurement.

(*b*) Battalion commanders and regimental staff officers: Same as under (*a*) and in addition 1 more trunk locker of same size as specified above.

(*c*) Regimental and brigade commanders and brigade staff officers: Same as under (*a*) and in addition 2 more trunk lockers of the same size as specified above.

14–55. Overcoat and sword.—When overcoats and swords are worn, officers will wear the scabbard outside the coat, with the short sling passing through the side slit, and the long sling through the back slit.

14–56. Useful articles.—The following additional articles should be carried, if possible, by officers on active service:

Landing-force Manual.	Knife.	Toilet articles.
Gun oil.	Sewing kit.	Hand mirror.
Maps.	Scissors.	Rubber basin.
Electric hand torch.		

14–57. Officers' clothing.—(1) The clothing to be worn or carried by officers will depend upon the climate and other circumstances of service, and must be limited in amount.

(2) White shoes will never be worn with leggings.

(3) A change of underclothing, two pairs of socks, one towel, a blanket, and an extra pair of shoes at least should be carried. No linen should be worn. Flannel shirts are preferable.

14–58. Transportation, or special carriers, shall, if possible, be provided for the officers' clothing and mess outfit.

When no other transportation is available, the servants or carriers of the several companies may work in pairs, each pair being provided with a light pole to be carried upon their shoulders; one pack may then be suspended in front of the leading carrier, one in rear of the rear carrier, and others on the pole between the two.

(2) Under exceptional circumstances officers will be required to carry their own packs.

(3) Officers will soon determine which articles to carry on their persons, and which to stow for transportation.

Men's Equipment and Clothing

14–59. Fully equipped.—The equipment will depend upon the circumstances of service. When fully equipped each man will carry pack carrier, packed, and haversack, rubber blanket, and cartridge belt, filled canteen, and leggings. The following clothing is carried in the pack: One suit of blue or white, one suit of underclothes, one white hat and one watch cap, one pair of shoes, two pairs of socks. (See art. 5–19 and figs. 84 and 85.)

There is no provision for carrying the overcoat on the pack. When weather conditions make it necessary to carry the overcoat it will have to be worn.

The haversack will contain rations, knife, fork, spoon, meat can, bacon can, and condiment can. Also a towel, soap, comb, toothbrush, tooth powder or paste, sewing kit, matches; and tobacco and pipe if desired.

When pack carriers are not provided, the most necessary of the above-mentioned articles will be carried in the blanket, neatly rolled lengthwise and stopped, the roll placed over the left shoulder, with both ends of the roll secured together under the right arm as described for an officer.

14–60. Lightly equipped.—When lightly equipped, men will carry filled canteens and cartridge belt and wear leggings. The pack carrier with haversack may be prescribed if circumstances require it.

14–61. The canteen complete includes the canteen, cup, and felt-lined canvas cover. These articles are always intended to be included, when it is prescribed that the canteen will be carried.

Chapter 15

PREPARATIONS, EMBARKATION, AND LANDING

Section I.—PREPARATIONS FOR LANDING

15–1. The decision to land troops and the method of landing should be the result of a proper *estimate of the situation*, having due regard to the opposing enemy forces, the object to be attained, and the force available for attaining it. The preparations to be made prior to landing fall practically under three heads: I. Information; II. Preliminary measures; III. Orders for the landing.

I. Information

15–2. Under this head should be considered:

(1) The strength and fighting capacity of the enemy.

(2) His organization, arms, artillery, etc.

(3) Number and location of his fortifications or defenses.

(4) The terrain in which operations are to take place, the roads by which to advance, and the distance.

(5) The probable resistance to be encountered, and the probable tactics of the enemy.

(6) The accessibility and suitability of various landing places, and whether, and to what extent, the operations on shore can be facilitated by fire from the ships.

(7) The availability of transportation facilities (including water transportation) after landing.

(8) The probable length of time the force will remain on shore, and the nature of the service.

II. Preliminary Measures

15–3. Under this head the following should be covered:

(1) Decide upon the strength of the force to be landed, what units of the various branches are to compose it, and what ships are to furnish them, and what equipment is to be taken.

(2) Outline at once a "refresher" training course for the landing force from Section III, Training and Shore Drill. If the time is limited and drill must be carried out aboard ship the following table may serve as a guide. Due to lack of deck space, much of this drill must be in the nature of lectures.

(*a*) Drill in assembling and making up equipment for heavy marching order.

(*b*) Drill in care and cleaning small arms, the various firing positions, and use of rests.

(*c*) Drill in extended order, the use of cover, digging hasty intrenchments, and combat signals.

(*d*) Drill in bayonet fighting.

(*e*) Organize the artillery units and drill in stations, nomenclature, care and service of the piece.

(*f*) Organize the machine-gun units and drill in stations, nomenclature, types of fire, their uses, and repair of casualties to the piece.

(*g*) Organize the special details into the headquarters unit (pioneers, communications, messengers, cooks, etc.).

(*h*) Detail the beachmaster and his assistants.

(*i*) Organize the medical unit and assemble all their gear.

(*j*) Instruct the whole landing force in first aid, hygiene, and all methods of transporting wounded men.

(*k*) Outline a study course in the Landing Force Manual for officers and petty officers commensurate with the duties they are to perform.

(3) Decide upon a base, and if necessary or desirable send ships to seize and fortify it.

(4) Decide upon a landing place and reconnoiter it. In fixing the time and place of landing the following points should be considered:

(*a*) The landing place should be under a lee if possible, and should be selected with reference not only to an advance, but in anticipation of a possible retreat or return to the boats.

(*b*) The beach in the vicinity should not afford cover for an enemy.

(*c*) The rise and fall of the tide must be noted, and a place selected where the boats can run close in and land their troops quickly.

(*d*) There should be good holding ground for covering-ships to anchor, or safe ground for them to maneuver during the landing.

(*e*) Decide on the method of landing. Boats may be beached, or if it is impracticable to beach the boats, an anchor should be dropped to seaward and the boats allowed to drop to within wading distance of the beach. This is particularly advisable if any surf is running. In beaching boats actual damage to the boats may be prevented by building temporary false bows or keels. Running in from an anchor dropped to seaward provides the greatest assurance of getting boats off again quickly.

(*f*) Each boat should use its boat lead in approaching the landing point.

(5) Make calculations regarding ammunition, equipment of all kinds, and provisions and water, for the first landing, and on a per diem basis thereafter.

(6) Make arrangements to keep the force supplied with provisions, water, and ammunition, and for keeping open a line of communications.

(7) Prepare plans for signal or other communication between the landing force and the ships.

(8) Obtain maps covering the area of operations, and make provision to furnish copies to all organization commanders. If no maps are available, necessary steps must be taken to map the area of operations, as far as possible, before the landing. In large cities and towns, maps usually exist and can be obtained.

(9) Make arrangements for the care of the sick and wounded.

(10) Obtain necessary transportation, utilizing water transportation and native carts, teams, etc., as far as possible.

III. The Orders for Landing

15–4. The orders for landing (see Combat orders, articles 19–39 et seq.) should cover all possible details of the organization, equipment, landing, and the service to be required:

(1) **Organization.**—What units of infantry, artillery, and other branches will land; what ships are to furnish these units, how they are to be organized, and who is to take command of the operations on shore; what companies, if any, are to take machine guns.

(2) **Arms and equipment.**—The uniforms, arms, and equipment of the men (articles 14–47 et seq. and articles 14–59 et seq.), and the ammunition, provisions, and water they are to carry; whether the extra clothing in their packs will be blue, white, or field.

(3) **Equipment of officers.**—The uniform, arms, and equipment of officers (see articles 14–46 and 14–52 et seq.), and whether or not their baggage will be transported for them.

(4) **Special details.**—The organization, arms, and equipment of the special details, servants, and other special men as may be required by the circumstances. An adequate working party should be detailed to assist the beachmaster in unloading boats.

(5) **Boats.**

(a) The assignment of the landing force to the boats and any special equipment the boats are to carry, such as a means for stopping shot-holes or buckets for bailing.

In assigning the force to boats, units should, as far as possible, be kept intact; i. e., whole companies or platoons in a single boat. If the oars are to be used, there should be in each boat sufficient men qualified to handle them. Within each boat squads should be seated together as far as possible.

(b) The assignment of **field artillery** to boats, for transportation ashore. The heavier launches will be used for this purpose. Field artillery is not suitable for firing from boats.

(c) What boats are to mount **boat guns and machine guns**, for assistance in covering the landing; preferably leading or flanking boats.

(d) Boats for supplies and equipment, provisions, and water, reserve ammunition, etc., and whether it is to be landed with the force or afterwards.

(e) Boats for **ambulance-party**, with the medical officer and assistants; **fast covered motor boats, flying the red cross flag.**

(f) Boats for **special details.** The special details will, if practicable, be grouped together in their own boats, especially if the landing is likely to be opposed. Circumstances will determine whether the noncombatant special details, such as cooks and officers' servants, will be landed with the force or afterwards.

(g) **Boat keepers** will be detailed as follows: Whaleboats, one; cutters, two; power boats, three or four as necessary.

(6) **Formation and landing.**

(a) The rendezvous of the flotilla, and its formation. Where no other formation is prescribed, it will be in line of columns.

(b) The maneuvering of the flotilla, and the time, place, and manner of landing.

(c) If opposed, whether the men are to land with their full equipment, or only with rifles, ammunition, and canteens, their other equipment being sent to them after the landing is effected.

(7) **Beach master** and his assistants, and their duties in detail as to the management of the boats, the construction of landing stages, the unloading of all material and placing it above high water mark and convenient to supply dumps, the maintenance of visual communication with the base vessel by visual signals and boat, the protection of the landing place, and the preparations for reembarking the force.

(8) **Stores and supplies.**—The quantity of provisions, water, and other stores, reserve ammunition, and equipment to be assembled for the landing force; how much of this is for immediate landing, and how much to be sent ashore later.

(9) **Covering ships.**—Positions and duties of the covering ships, and the points against which they are to direct their fire. The distances of conspicuous objects, or of cover for the enemy, should be known or measured beforehand, if possible. The positions chosen should be such as to cover the landing place, and any possible points from which hostile fire may be directed, especially artillery fire.

Lookouts, with glasses, should be sent aloft on all ships to scan the beach, and to report, not only to the ships, but to the landing force, the positions and movements of the enemy before, during, and after the landing.

(10) **Communications.**—The method of communicating between the landing force and the covering ships, and with the ships after the force is landed.

(11) **General remarks.**—(a) In the orders for landing outlined above, all points are considered in their proper sequence, and the general outline should be followed, for the sake of uniformity.

(b) Additional necessary measures, not covered above, should be inserted under their proper heading.

(c) All offices, to and including company commanders, should be furnished with copies of the landing orders, with a view to expediting preparations, insuring cooperation, and eliminating unnecessary messages and signals.

(d) Maps, and such other information as may be necessary to the intelligent and vigorous performance of their duties, should be furnished to those concerned.

(12) **Special instructions.**—The officer commanding the force should be given instructions as to the discretion he may use in the advance, and in the operations after landing is effected.

Final Inspection

15–5. (1) **Personnel.**—The different units of the landing force having been equipped in accordance with the orders, should, if practicable, be assembled for a careful muster and final inspection before landing.

(2) **Matériel.**—(a) All matériel, ammunition, stores, etc., should be collected, checked, and inspected preparatory to landing.

(b) Careful and complete lists of all kinds of matériel will be taken by the officers, and every preparation made for its proper distribution and expenditure, so that the amount on hand shall be known at all times, and requisitions be prepared to anticipate future needs.

Section II.—THE EMBARKATION AND LANDING

15–6. **The embarkation.**—At the appointed hour, after all ships have signalled that their forces are in readiness, the commander in chief makes the necessary signals for the covering ships to take their positions and for the force to embark.

15–7. Where a daylight surprise is desired, men should embark in their boats under the cover of darkness and the tows be made up and started for the beach before dawn. This precaution is particularly applicable when ships have moved to within range of the beach and the landing force might be fired upon during embarkation.

15–8. **Each ship's landing force embarks** in the boats assigned, and forms column (or columns) on the starboard (or port) beam, in the following order: Motor boats, motor launches, cutters, and whaleboats. The battalion commander, in the leading boat, takes the other boats in tow, assisted by their engines or oars, if necessary, and proceeds to the **rendezvous.**

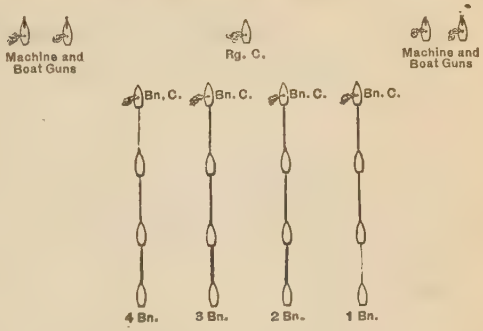

FIG. 223.—Line of columns

The Flotilla of Boats

15–9. After each ship's force has arrived at the **rendezvous,** any further redistribution of boats necessary to carry into effect the prescribed organization and formation is accomplished, and the flotilla is formed. The normal formation will be that of **line of columns,** each bn. c. towing the boats of his battalion.

Tow lines should not be too short and the boat columns should be well separated in order not to present a bunched target for hostile fire.

Boats mounting machine guns and boat guns will be leading or flanking boats, preferably other than those used for landing the force.

15–10. **Whistle signals.**—The following whistle signals may be used, where not likely to give the alarm to the enemy.

(1) When the tow is made up and lying-to after straightening out the tow lines:
Three blasts, stand by boat engines (stand by to boat the oars).
Two blasts, start engines ahead (boat the oars).

(2) Being in tow, preliminary to disembarking:
Three blasts, prepare to cast off (stand by the oars).
Two blasts, stand by boat engines (out oars).
One blast, cast off.

15–11. **Maneuvering the Flotilla.**—The flotilla, in line of columns or other formation, is maneuvered by order or signal of the rg. or bg. c., depending on the size of the force, the prescribed method of landing, and the resistance encountered. It will not normally be formed in line until just prior to landing, as that formation is unwieldy.

The Landing

15–12. A landing force can not land where the beach is defended by effective artillery fire. This fire must be silenced by the fire of the covering ships before the landing is attempted. If the covering ships are unable to accomplish this, it will usually be better to change the place of landing and attempt to capture the position by a flanking movement.

15–13. Ordinarily it is not safe to attempt to land in the heart of a city at the customs or other municipal wharves. To do so may incur severe losses from well established hostile fire. A feint may be made in this locality while a sudden surprise landing is effected on one or more beaches flanking the city to be taken. A landing of this sort allows the forces to flank the city, seize commanding ground and cut off avenues of escape. This ensures that with the fall of the city all or most of the enemy will be captured and save future tedious operations of capturing them in the back country.

15–14. If the beach is defended by riflemen, boat and machine-gun fire will be of great assistance, especially that from the flanking boats, which subject the enemy's position to crossfire.

15–15. As it is impracticable to deliver effective rifle fire from boats, the main body of the landing force is held beyond effective range of the enemy until the fire of the defenders has been silenced or at least partially reduced.

15–16. It is impracticable to prescribe an exact formation for landing. In general, the plans follow, as far as possible, those of an infantry attack on shore.

The artillery and supply boats, as also the ambulance boats, are held in the rear until the landing is effected. Certain companies or battalions of infantry may be designated to land first and form a firing line, the other companies or battalions being held in reserve. Or, depending on circumstances, all of the infantry boats may rush the beach at the same time.

15–17. Immediately after landing, each company of the firing line deploys at once, and makes a rush for such position or positions as may have been designated by the c. c. prior to the landing, utilizing such cover as may be available.

15–18. After the landing has been effected, the landing force is handled and maneuvered in accordance with the demands of the tactical situation, the mission to be accomplished, and the principles of land warfare. (See chap. 19 and Part III.)

Precautions After the Landing

15–19. Patrols.—If the landing has been unopposed, or when opposition ceases, specially instructed patrols are sent out at once in all directions to obtain contact with the enemy and report, or signal, information. This precaution must always be taken, whether the force is to advance or to remain at the place of landing. (See arts. 17–50 et seq.)

15–20. Outposts.—If the force is not to move, outposts shall be established without delay, and every precaution shall be taken to meet an attack. (See arts. 16–56 et seq.)

15–21. Advance and rear guards.—If the force is to advance after the landing, the necessary advance and rear guards shall be formed immediately, and the special patrols shall be instructed as to the route to be followed, that they may keep in touch and transmit information promptly. (See arts. 17–74 et seq.)

15–22. Beach-master and boat-keepers.—(1) If the boats are to return to the ship after the landing, the beach-master will direct the boat-keepers to haul their boats off, and he will have them taken in tow and sent back to the ships.

(2) In case the boats are to remain at the landing place, the beach-master will have them hauled off and anchored with stern-lines to the beach, or properly secured at the landing place, in readiness for the prompt reembarkation of the force.

15–23. To defend the landing place.—The beach-master and boat-keepers will be employed, as far as possible, to place the beach or point of landing in such condition as to secure it against attack. A detachment from the landing force may be detailed to assist, or additional men may be sent from the ship, if necessary.

15–24. Signals.—At all times a bright lookout must be kept for signals both afloat and ashore. A signal station, visible from the ships, should be selected at or near the landing place.

Reembarkation

15–25. The return or retreat of a landing force must be carefully anticipated and provided for. In general, the reembarkation will be conducted in the reverse manner to the landing:

(1) The covering ships will be signaled from time to time in order that they may use their guns if necessary, and covering boats, with machine and boat guns, will be stationed.

(2) Under cover of a strong firing line, the main body of the infantry and artillery will embark and pull well clear of the beach or landing, assisted by machine and boat gun fire upon the flanks of the position.

(3) The firing line will retire slowly, keeping up a vigorous defense and occupying the cover at the landing place until directed to embark.

(4) The firing line will then embark as quickly as possible and pull away from the landing, under cover of a rapid fire from the ships and from the boat and machine guns.

Information in the Field

15–26. Information in the field is obtained from various sources—higher commanders, adjoining troops, inhabitants, newspapers, letters, telegraph files, prisoners, deserters, spies, maps, and reconnaissances. Knowledge of the terrain, always essential to a correct understanding of the situation, is obtained from a careful study of available maps, supplemented by thorough reconnaissance.

All information of the enemy and of the theater of operations is sent to the intelligence section headquarters of the brigade. This section weighs and classifies the information brought in and supervises the preparation of the necessary field maps.

15–27. In hostile territory influential persons, especially those supposed to be active in the enemy's cause, may be seized and their persons and houses searched. Letters and newspapers in post offices and files in telegraph offices are carefully examined and anything of importance sent to higher authority. Matter not of importance is replaced, if time permits; if not, the whole is sent to headquarters. Local maps of recent date may be of great value.

When reliable information of the enemy can not be obtained, it is assumed that he will act with good judgment.

Information received by any person in the military service, and the action taken thereon, must be promptly reported to the proper military superior.

Unless instructions have been given to spread false information, all persons connected with the military service are forbidden to discuss the military situation, plans, movements, etc., with, or in the presence of, civilians of any age, sex, or nationality.

15–28. Reconnaissance is the military term used to designate the work of troops or individuals when gathering information in the field. Reconnaissance begins as soon as the theater of possible operations is entered and continues throughout the campaign. No matter what other sources of information of the enemy may be available, reconnaissance must be depended upon to obtain the information upon which all tactical movements of troops should be based.

Records in the Field

15–29. Commanders of companies and larger units will keep, or cause to be kept, rosters and other records, sufficient to enable such officer to make a complete report of the operations in which his organization has been engaged, and will keep his immediate superior informed in writing of such routine matters or events of importance as may be required or desirable.

Such communications in the field fall under three general heads: Messages, reports, and war diaries.

15–30. The term **message** is generally applied to written information sent by messenger or wire. Such messages should be brief and clear, resembling telegrams. The source of the information contained in the messages is always given, the writer carefully separating what he has actually seen himself from that received secondhand. Most of the rules adopted to secure clearness in orders apply equally to messages.

15–31. A **report** is a more or less formal account of some enterprise, undertaking, or event, such as a march, reconnaissance, battle, etc. A report is usually drawn up at comparative leisure, is often the supplement and expansion of short messages, and thus possesses the value of greater detail.

15–32. A **war diary** is a record of events kept in campaign by each battalion and higher organization. Entries are made daily and should form a concise history of the military operations. A day comprises 24 hours covered by the date.

Each day's record will commence with a march table, or statement of the operations or location of the organization, including an account of weather, roads, camp, health of troops, etc., and a statement of the supply of ammunition, rations, and forage. This will be followed by a chronological record of events, including time and place of issue and receipt of orders and messages, with a copy or a synopsis of contents.

It is of special importance that the exact hour and place at which movements are begun and ended, and orders or important messages sent or received, be noted. After an engagement, the war diary will contain a report of losses and captures and will be accompanied by a sketch showing the positions of the command at the most important phases.

Each day's record will be attested by the commander or by the adjutant; and, with attached copies of orders and messages sent and received, will be forwarded daily to the next higher commander, who, as soon as practicable after the receipt thereof, will forward the war diary through official channels to the Navy Department (Operations), or headquarters of the Marine Corps.

Section III.—TRAINING AND SHORE DRILLS

15–33. In order that the landing force may be properly trained, the organized units must be given systematic instruction and drill.

Since the number of shore drills and exercises is necessarily limited, every opportunity should be taken advantage of to impart such instruction as is practicable on board ship. This instruction consists of lectures, practical demonstrations, and exercises.

When properly prepared these exercises are of great benefit to officers and men, and by making them progressive in nature, no difficulty will be experienced in holding the attention and interest of all concerned.

The instruction includes the following:

1. Nomenclature, care, and cleaning of the rifle.
2. Correct firing positions and use of the gun sling.
3. Sight setting.
4. The loadings and firings, safety precautions, and kinds of fire.
5. Arm and whistle combat signals.
6. Military hygiene, first aid, camp sanitation, and transportation of wounded men.
7. Scouting and patrolling.
8. Advance and rear guards, and outposts.
9. Use of cover.
10. Adjustment of equipment, arrangement of clothing, rations, and toilet articles in the pack; demonstration in making up the pack.
11. Officers' and petty officers' school in the Landing-Force Manual.
12. Instruction of company signalmen and of the pioneers and ambulance parties in their duties.
13. Nomenclature, care, and cleaning of the pistol.
14. Nomenclature, care, and cleaning of the machine gun.
15. Use of the machine gun, kinds of fire, causes and correction of interruptions in their fire, and machine-gun emplacements.
16. Intrenchments, their construction and use; preparation of buildings for defense; barricades, etc.
17. Messages and reports.
18. Bayonet fighting.
19. Pitching and striking tents.
20. Mapping and sketching for officers, especially practice in making range cards.

In addition to the above the **Artillery companies** should be given the following instructions on board ship:

21. Nomenclature, care, and cleaning of the gun and gun sights.
22. The training of the crew, and of a spare crew, in their duties at the piece.
23. The use and nomenclature of all range finding, and firing data determining, instruments.
24. Nomenclature and setting of fuses.
25. The kinds of fire that may be employed.
26. Methods and objects of fire.
27. Preparation of firing data.

15–34. The landing force should be thrown ashore for drill as often as practicable. No amount of instruction on board ship can compensate for lack of shore drills and practical work.

Close-order drill is employed to obtain that teamwork, ready and implicit obedience to command, and fire discipline, that can not be gained by any other means.

15–35. When proper smartness and precision in close-order drills has been gained, all fighting formations, extended order, advance and rear guard work, and patrolling can be more easily taught, and should always constitute most of the drill period. However, the drill should always end with a short, well-conducted, close-order drill.

15–36. Practice marches should be included from time to time, as circumstances permit. It is important to have good march discipline, and it can not be taught without marching. During such marches instruction in security, patrolling, deployment for action, passage of defiles, and halts for the night, including the disposition of outposts, are included in the exercises.

15–37. The best results at drill and in actual service in the field are obtained by those officers who take the greatest interest in the welfare and comfort of their men, who share their hardships cheerfully, and who are themselves examples of what their men should be. *A company always reflects the character of its officers.*

Section IV.—MISCELLANEOUS DATA

15–38. The following list of equipment forms a part of the standard issue to Marine Corps organizations. It is useful as a guide for assembling similar equipment, when available, for the landing force:

I. Reconnaissance outfit for each battalion and regiment

1. Equipment

1 alidade.
2 boards, sketching.
1 chest, sketching outfit.
1 clinometer, service, with case.
1 holder, timing pad.
1 pace tally.
1 pencil, pocket.
1 tripod, wood, folding.

2. Supplies

12 celluloid sheets.
2 erasers, rubber.
6 pads, timing.
72 paper, sketching board, sheets.
2 pencils, blue.
6 pencils, drawing, H.
2 pencils, green.
2 pencils, red.
2 protectors, pencil point.
2 tape, adhesive, rolls.

II. Battery commander's fire control equipment (Artillery only)

1 sextant telemeter and case, or
1 range finder.
2 steel tapes, 100 feet.
2 battery commander's rules with cases.
1 battery commander's telescope and case.
1 tripod for battery commander's telescope and case.
2 time interval recorders.
2 time interval recorder chains.
1 battery case.
1 field glass, type C, in case.
3 telephones, in cases.
2 hand reels.
2 spools, double buzzer wire.
3 inspector's pocket kits.
2 flag kits, 2 feet.
2 megaphones, model 1911.
6 field glasses, type B, in cases.
4 buzzer connectors.
3 plugs for telephones.

III. Company equipment

1. Spare parts kit for rifle

2 bolts.
7 firing pins.
5 cut-offs.
5 ejectors.
5 ejector pins.
5 extractors.
10 front sights.
10 front sight pins.
10 front sight covers.
2 lower band screws.
2 rear sight joint pins.
3 rear sight slides, assembled.
5 rear sight slide binding screws.
4 rear sight slide cap pins.
5 rear sight slide cap screws.
2 rear sight windage screws, assembled.
2 safety locks, complete.
1 sear.
2 stacking swivels.
2 magazine springs.
2 main springs.
2 stacking swivel screws.
20 strikers.

2. Repair kit for model 1903 rifle

1 chest.
1 anvil and block.
1 bullet jacket extractor.
10 drifts (1 each of Nos. 1, 2, 3, 4, 5, 6, 7, and 9; and 2 of No. 8).
1 hammer, steel.
1 pair of pliers.
3 screw drivers (Nos. 1, 2, and 3).
1 set (No. 1).
1 assembling tool.
1 block, wood.[1]
1 hammer, brass.[1]
1 set (No. 2.)[1]

3. Cleaning and spare parts kit for pistol

2 plugs.
2 recoil springs.
1 cleaning box, with packing block.
10 cleaning rods.
10 thong brushes.
10 screw drivers.
1 oil can.
1 grease pot.

4. Intrenching tools provided for each squad

1 hand ax, with carrier.
1 pick mattock, with carrier.
3 shovels, with carriers.
1 wire cutter, with carrier.
1 machete, with carrier.

5. Company tool box

1 company tool box.
1 marking brush.
1 hatchet.
1 claw hammer.
6 sail needles.
1 padlock.
1 sail palm.
1 nail puller.
1 brass stencil, ½-inch.
1 ratchet brace.
3 auger and brace bits.
1 jack plane.
1 tape measure, 75 feet.
1 cross-cut saw.
1 rip saw.
1 screw driver.
1 steel square.
¼ pound of beeswax.
5 yards tent canvas, 8-oz.
200 feet clothesline.
15 pounds wire nails, 8-penny.
1 gross wood screws.
3 pounds galvanized iron wire (100 feet).
1 pound sail twine.

[1] The last three items are for regulating the socket spring of the cartridge belt, Model 1903.

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6. Company police chest

1 company police chest.
1 padlock.
2 axes.
2 pickaxes.
2 pavement scrub and stable brooms, with handles.
2 ax handles.
2 pickax handles.
6 machetes.
6 mallets, L. H.
2 iron rakes.
4 shovels, short handles, square point.
4 spades.

7. Officers' mess chest (per company)

1 chest.
1 corkscrew.
1 padlock.
1 vinegar bottle.
1 soup bowl, enamel.
1 sugar bowl, enamel.
1 pepper box.
6 table knives.
1 can opener.
1 water pitcher, enamel, 1 pint.
6 dinner plates, enamel.
1 meat plate, enamel.
6 soup plates, enamel.
1 coffeepot.
6 cups, enamel.
1 butter dish, enamel.
2 vegetable dishes, enamel.
1 carving fork.
6 table forks.
1 carving knife.
1 salt cellar.
6 saucers, enamel.
4 tablespoons.
8 teaspoons.
8 tumblers.

8. Field range (Donavin) complete

1 range.
4 boilers with lids, nested.
1 cleaver.
1 pot chain.
1 meat chopper.
1 dipper.
3 dredgers.
1 carving fork.
1 meat fork.
1 griddle, iron.
1 tent guard.
1 bread knife.
1 butcher knife.
1 carving knife.
1 ladle, solid.
1 ladle, pierced.
1 frying pan.
2 roasting pans.
5 joints of stovepipe.
1 elbow.
1 can opener.
1 meat saw.
1 shovel.
1 sieve.
1 skimmer.
1 basting spoon.
1 butcher steel.
1 cake turner.

IV. Dimensions and weights (miscellaneous)

	Pounds
1 box of ammunition (1,200 rounds) cal. 30 rifle	95
1 box of ammunition (2,000 rounds) cal. 45 pistol	110
1,000 rations weigh about	3,800
Field range with utensils	410
Hospital tent (complete)	225
Wall tent (complete)	99
Shelter tent (complete), 2 poles, 10 pins	8½

Dimensions of tents:
Hospital tent (pitched) 14 feet long by 14 feet 6 inches wide.
Wall tent (pitched) 9 feet long by 8 feet wide.
Each shelter tent half is 65 by 61 inches.

V. Lewis machine gun, Mark VI

Lewis machine gun, Mark VI (stowed in gun box).
Machine-gun carts, Marine Corps type (Cole cart).
Marine Corps type pumps.
Air valves for tires of machine-gun carts.
Valve caps for tires of machine-gun carts.
Outfit of quick patches for inner tubes of machine-gun carts.
Mounts, Mark VI.
Mounts, Mark VII.

1. Gun boxes each containing—

1 barrel.
1 barrel mouthpiece spanner.
1 bipod mount.
1 bolt, complete, consisting of:
  1 bolt.
  1 feed operating stud.
  2 extractors.
1 butt latch pin.
1 back sight elevating screw head pin.
2 cartridge guides, assembled.
1 charging handle extension (wood).
1 charging handle.
1 combination cleaning rod complete (steel) consisting of:
  1 adaptor.
  1 barrel cleaning brush (bristle).
  2 cylinder cleaning brushes (wire).
  1 rod.
1 ejector
2 extractors.
2 feed pawl springs.
gear stop pin.
1 gear stop spring.
6 hand books.
2 magazine containers.
12 magazines packed in above containers (6 per container).
2 magazine loading handle in magazine container.
1 mainspring, including keeper.
1 mainspring casing, assembled.
1 mainspring collet.
1 oil can.
1 piston, complete, consisting of:
  1 piston.
  1 piston connecting pin.
  1 rack.
  1 striker.
  1 striker fixing pin.
  1 receiver locking pin.
  1 rear sear pin.
  1 sear spring.
  1 shell extractor.
  2 stop and rebound pawl springs.

2. Additional spare parts and accessories not in gun box

Barrel.
Barrel cleaning brush.
Barrel mouthpiece.
Barrel mouthpiece spanner.
Back sight leaf, assembled.
Back sight axis pin.
Back sight axis pin washer.
Back sight axis pin split keeper.
Back sight bed spring.
Back sight leaf.
Back sight slide.
Back sight elevating screw.
Back sight elevating screw head.
Back sight elevating screw head pin.
Back sight elevating screw head spring.
Bolt complete.
Butt stock assembled.
Butt plate screw.
Butt latch pin.
Butt latch spring.
Cartridge guide, assembled.
Case gun loader.
Charging handle.
Charging handle extension.
Clamp ring screw.
Clamp ring positioning screw.
Combination cleaning rod (steel).
Cylinder cleaning mop.
Cylinder cleaning brush (wire).
Extractors.
Ejectors.
Ejector covers.
Feed operating arm, complete.
Feed pawl.
Feed pawl spring.
Front sight, normal.
Front sight, high.
Front sight, low.
Gas chamber.
Gas chamber gland.
Gas regulator cup.
Gas regulator key.
Gas cylinder.
Guard, assembled.
Gear stop.
Gear stop pin.
Gear stop spring.
Mainspring rivet.
Mainspring including keeper.
Mainspring casing.
Mainspring collet.
Mainspring collet pin.
Magazines, assembled.
Magazine container, empty.
Magazine latch spring.
Magazine latch.
Magazine top plate.
Magazine top plate rivet.
Magazine spacer ring assembled.
Magazine spacer rivet.
Magazine separator pin.
Magazine loading handle.
Magazine loader.
Oil can.
Piston.
Piston connecting pin.
Rebound pawl.
Rack.
Receiver locking pin.
Rear sear pin.
Stop pawl.
Stop and rebound pawl spring.
Striker.
Striker fixing pin.
Safety.
Sear spring.
Shell extractor.
Spring balance.
Trigger.

Chapter 16

INTERIOR GUARD DUTY

Section I.—GENERAL INFORMATION

16–1. Definitions.—*a.* Wherever the term "post," other than in the sense of a sentinel's post, is used, it will be construed to include garrison, naval station, or camp.

b. Wherever the word "company" is used, it will be construed to include troop, battery, or similarly organized units.

c. Wherever the term "guardhouse" is used, it will be construed to include guard tent or any other designated location for the guard.

16–2. Purpose.—Interior guards are used in posts to preserve order, protect property, and enforce police regulations.

16–3. Classification.—The various elements of an interior guard, classified according to their purposes and the manner in which they perform their duties, are as follows:

a. The main guard.

b. Special guards: Park guards, prisoner guards, herd guards, train guards, boat guards, watchmen, etc.

16–4. Composition.—*a.* An interior guard will be of such strength as the commanding officer may direct. It will be supervised by the officer of the day and commanded by the officer of the guard next in rank to the officer of the day, or by the senior petty officer of the guard if there be no officer of the guard. In large commands where there is more than one guard a field officer of the day may be detailed to supervise them.

b. The system of sentinels on fixed posts is of value in discipline and training because of the direct individual responsibility which is imposed and required to be discharged in a definite and precise manner. In order that guard duty may not, however, be needlessly irksome and interfere with tactical instruction, the smallest possible number of men will be detailed for guard.

Section II.—DETAILS AND ROSTERS

16.–5. Guards to be mounted at all posts.—At every military post an interior guard will be detailed and duly mounted except at posts where the watchmen system of guard only is prescribed.

16–6. Detailed by company or otherwise.—*a.* At posts where there are less than three companies the main guard and special guards may be furnished by one company, or by detail from each.

b. Where there are three or more companies the main guard should be furnished by a single company which will supply all details for special guards for that day. The officer of the day and the officers of the guard, if there be any, should be detailed from the organization furnishing the guard.

c. At a post where the headquarters of more than one regiment are stationed, or in the case of a brigade in the field, the details will be made by the headquarters of the command if but one guard is necessary.

16–7. Intervals between tours.—*a.* The strength of guards and the number of consecutive days for which an organization furnishes the guard will be regulated so that men of the main guard will have an interval of not less than 5 days between tours.

b. When such result is not possible, special duty men while still performing their daily duties will be detailed for night guard duty. A roster will be kept by the c. p. o. showing the duties performed by them.

16–8. Length of tour.—The members of the main and park guards will habitually be relieved every 24 hours. The length of the tour of enlisted men detailed on other guards will be regulated by the commanding officer.

16–9. Vacancies.—Should the officer of the day be notified that men are required to fill vacancies in the guard, the adjutant will be notified and will cause substitutes to be provided from the company or companies furnishing the

guard. If one company furnishes the guard and none is available in that organization, the adjutant will be notified and will cause them to be supplied from the company that is next for guard.

16–10. Data for details.—*a.* There will be posted on the bulletin board at headquarters all data necessary for commanders to make details from their organizations. This information will be posted not later than noon of the day preceding that on which it becomes effective. In addition it should include directions relative to guard mounting, whether formal or informal, and prescribe the uniform to be worn.

b. At chief petty officers' call, c. p. os. will take from the headquarters bulletin board all data necessary for making the details required from their organizations. These details will be made from their organization rosters.

c. If formal guard mounting is to be held, the adjutant, c. p. o., and band to attend will be designated by the commanding officer.

16–11. Notice of details.—Within companies, guard details will be posted on bulletin boards immediately upon receipt. They also will be read to organizations by petty officers at retreat. Officers will be notified in person or by written order of their detail for guard not later than noon of the day preceding the beginning of their tour.

16–12. Detail of officers.—*a.* When more than one main guard is required for a command, a field officer of the day may be detailed who will receive his orders from the commanding officer. When necessary, lieutenants, U. S. N., or captains, U. S. M. C. may be placed on the roster for field officer of the day.

b. There will be an officer of the day and an officer of the guard detailed with each guard unless in the opinion of the commanding officer the guard is so small that an officer of the guard is considered unnecessary, in which event the senior petty officer of the guard becomes the commander of the guard. Inexperienced officers may be detailed as supernumerary officers of the guard for purposes of instruction.

c. Staff officers may in the discretion of the commanding officer be removed from the roster for guard.

16–13. Method of keeping rosters.—*a.* Where required by these regulations all details will be made by roster. When a single organization furnishes the guard, a roster of organizations will be kept by the c. p. o. When details for guard are made from a single organization no account will be taken of a very small disproportion in the strength of the companies. When the disproportion is considerable a roster will be kept by the c. p. o. in order that guard duty may be equally divided and no one organization be made to shoulder an excessive amount of duty.

(*b*) When the guard is detailed from several organizations, rosters will be kept as follows:

(1) By the adjutant; of officers of the day and guard by name.

(2) By the battalion chief petty officer; of chief petty officers, petty officers, buglers, and nonrated men by number per organization, and of special detail men by name.

(3) By chief petty officers; of first petty officers, petty officers, buglers, and nonrated men.

(*c*) In order that guard duty may not be needlessly irksome and interfere with tactical instruction, the number of men detailed for guard will be the smallest possible. Commanding officers are specifically charged with this matter.

Section III.—DUTIES OF PERSONNEL

16–14. Commanding officer.—*a.* The commanding officer will exact a faithful, vigilant, and correct performance of guard duty in all of its details, giving his orders to the officer of the day, or causing them to be communicated to him. He will prescribe the strength of and the necessary regulations for the guard.

b. The commanding officer, or his representative, receives the reports of the officers of the day at the place designated by him and immediately after guard mounting. He, or his representative, carefully examines the guard report (questioning the old officer of the day, if necessary, regarding his tour of duty), and then relieves him and gives the new officer of the day his instructions.

c. The commanding officer will exercise such personal supervision over the guardhouse as to comply fully with the U. S. Navy Regulations, chapter 4.

16–15. Field officer of the day.—The field officer of the day is responsible for the proper performance of duty by the guards with which he marches on and for their instruction and coordination. He makes such inspections and reports

as the commanding officer directs. Immediately after guard mounting both the old and new field officers of the day report to the commanding officer or his designated representative in the manner prescribed for the officers of the day. (See par. 16–16 *l*.)

16–16. Officer of the day.—*a*. The officer of the day is responsible for the proper performance of duty by the guard with which he marches on and for the enforcement of all police regulations. He is charged with the execution of all orders of the commanding officer relating to the safety and good order of the post.

b. His actual tour begins when he receives the instructions of the commanding officer after guard mounting, and ceases when he has been relieved by the same authority.

c. In case of emergency during the interval between guard mounting and reporting to the commanding officer, the officer of the day senior in rank assumes authority over both guards.

d. In the absence of special instruction from the commanding officer, the officer of the day will inspect the guard and sentinels at such times during the day and night as he may consider necessary. He will visit them at least once between midnight and daylight.

e. He prescribes patrols and visits of inspection to be made by officers and petty officers of the guard whenever he considers it necessary.

f. He informs the commander of the guard of the presence in the post of any person entitled to the compliment from the guard.

g. In case of alarm of any kind he will at once take steps to insure the safety of life and public property and to preserve order, using the guard for this purpose.

h. In the performance of his duties he takes orders only from the commanding officer and field officer of the day, except that in case of an alarm of any kind, and at a time of great danger, the senior line officer present is competent to give necessary orders to the officer of the day for the employment of the guard.

i. The officers of the day together verify the count of prisoners and inspect the guardhouse and premises.

j. In the absence of special instructions the old officer of the day at guard mounting releases all garrison (summary court-martial) prisoners whose sentences expire that day. If there are prisoners with no record of charges against them, the old officer of the day reports that fact to the commanding officer or his representative.

k. The old officer of the day signs the report of the commander of the guard entering thereon his remarks or comments.

l. After guard mounting the officers of the day report to the commanding officer or his representative as follows: On presenting themselves, both salute. The old officer of the day, standing on the right of the new, then says, "Sir, I report as old officer of the day," and presents the guard report. As soon as the commanding officer or his representative notifies the old officer of the day that he is relieved, the latter salutes and retires. The new officer of the day again salutes and says, "Sir, I report as new officer of the day." After receiving his instructions he salutes and retires.

m. The officer of the day keeps the guard informed as to where he may be found at any time.

16–17. Commander of the guard.—*a*. The commander of the guard is responsible for the instructions and discipline of the guard, and under the officer of the day for the general safety of the post as soon as the old guard marches away from the guardhouse. While both guards are at the guardhouse, the commander of the guard senior in rank is responsible that the proper action is taken in case of emergency.

b. He receives and obeys the orders of the commanding officer, field officer of the day, and officer of the day, and reports to the last named all orders to the guard not received from him. He transmits to his successor all instructions and information relating to his duties. He will see that all members of the guard are correctly instructed in their orders and duties and that they understand and properly perform them. He questions his petty officers and sentinels relative to the instructions they may have received from the old guard. He will see that patrols properly perform their duties and that visits of inspection as directed by the officer of the day are made. He will see that the special orders for each post and member of the guard are posted in the guardhouse and in the sentry boxes or other sheltered places to which the members have constant access. When the countersign is used, he will communicate it to the

petty officers of the guard and see that it is duly communicated to the sentinels before the hour for challenging. The countersign will not be given to sentinels posted at the guardhouse.

c. The commander of the guard will inspect the guard at reveille and retreat, and at such other times as may be necessary, to assure himself that the men are in proper condition to perform their duties and that their arms and equipment are in proper condition. For inspection by other officers he will prepare the guard in each case as directed by the inspecting officer. He will visit each relief at least once while it is on post and at least one of these visits will be made between midnight and daylight. He will inspect the guardrooms and cells and the irons of prisoners who are handcuffed or shackled at least once during his tour, and at such other times as he may consider necessary. He will inspect all meals sent to the guardhouse or prepared therein, and will see that the quantity and quality of food are satisfactory.

d. Officers of the guard will remain constantly with their guards except while visiting patrols or necessarily engaged elsewhere in the performance of their duties. They will be allowed a reasonable time for meals by the commanding officer. A commander of the guard leaving his post for any reason will inform the next in command of his destination and probable time of return. Except in emergencies, the commander of the guard may divide the night with the next on command, but retains his responsibility. The one on watch must be constantly on the alert.

e. When an alarm is raised, the guard will be formed immediately. If the case is serious, the proper call will be sounded and the commander of the guard causes the commanding officer and the officer of the day to be at once notified. If a sentinel calls "The guard," the commander of the guard will at once send a patrol to the sentinel's post. If the danger is great, the sentinel will discharge his piece three times in rapid succession; the patrol then is made as strong as possible. There should always be an officer or petty officer and two men of the guard at the guardhouse in addition to the sentinels there on post.

f. The commander of the guard will see that proper calls are sounded at the hours prescribed by the commanding officer.

g. He causes the details for raising and lowering the flag at reveille and retreat and the detail for firing the saluting gun to be made in time for the proper performance of these duties. He will see that the flags are kept in the best possible condition and that they are never handled except in the performance of duty. When flags are not in a serviceable condition he will report that fact to the adjutant.

h. He will see that all sentinels are habitually relieved every 2 hours. If for any reason it is desirable that this relief be at shorter or longer intervals, the authority of the commanding officer will be obtained.

i. Should a member of the guard be taken sick or for any reason leave his guard, the commander of the guard will at once notify the officer of the day.

j. He may permit members of the guard while at the guardhouse to remove their headdress, overcoats, and gloves, but if they leave the guardhouse, he will require that they be properly equipped and armed according to the character of the service in which engaged or as directed by the commanding officer.

k. The commander of the guard will detain at the guardhouse all suspicious persons or parties attempting to pass a sentinel's post without authority. He will report the circumstances to the officer of the day who will decide what action is to be taken. (See pars. 16–18*j* and 16–19*o*.)

l. He is responsible for the security of the prisoners under charge of the guard. He becomes responsible for them after their number has been verified and they have been turned over to the custody of his guard. The prisoners will be verified and turned over to the new guard without parading them unless the commanding officer or officer of the day directs otherwise. When any person is sent to the guardhouse for confinement the commander of the guard will cause him to be searched for any unauthorized articles in his possession. He will report the fact of confinement to the officer of the day without delay. Immediately before each relief goes on post the commander of the guard causes the p. os. of the old and new reliefs to verify together the number of prisoners who should then be at the guardhouse. He sees that the sentences of prisoners under his charge are strictly executed. At guard mounting he reports to the old officer of the day all cases of prisoners whose terms of sentence expire on that day, and also all cases of prisoners concerning whom no statements of charges have been received.

m. He will enter a report of his tour of duty in the guard report book and on completion of his tour present it to the officer of the day together with all passes turned in at the guardhouse.

16–18. C. p. o. of the guard.—*a.* The senior chief petty officer of the guard, whatever his grade, will officially be known as the c. p. o. of the guard. If there is no officer of the guard he will perform the duties prescribed for the commander of the guard.

b. The c. p. o. of the guard will have general supervision over the other petty officers, the buglers, and nonrated men (except orderlies) of the guard, and must be thoroughly familiar with all of their orders and duties.

c. He is directly responsible for the property under charge of the guard and will see that it is properly cared for. If it is not he will immediately report the facts to the commander of the guard. He will list all articles taken out by working parties and see that all such articles are returned in good condition unless same are issued and cared for by the prison officer or similar authority.

d. Immediately after guard mounting he will prepare duplicate lists of the names of the petty officers, buglers, and nonrated men of the guard, showing the reliefs and posts or duties of each. One list is given as soon as possible to the commander of the guard and the other retained by himself.

e. He will see that all reliefs are turned out at the proper time and that the p. os. thoroughly understand and are prompt and efficient in the discharge of their duties.

f. He will make such inspections and see that the other p. os. of the guard make such inspections and patrols as may be prescribed by superior authority.

g. During the temporary absence from the guardhouse of the c. p. o. of the guard the next ranking p. o. will perform his duties.

h. Should the p. o. whose relief is on post be called away from the guardhouse, the c. p. o. of the guard will temporarily take his place or designate another p. o. to do so. (See par. 16–19*f*.)

i. The c. p. o. of the guard is responsible for the proper police of the guardhouse, including the ground around it.

j. He will report to the officer of the guard or, when there is none, to the officer of the day, any suspicious or unusual occurrence that comes under his notice, warn him of the approach of any armed body, and notify him of all persons arrested by the guard.

k. The c. p. o. of the guard has direct charge of the prisoners, except during such times as they are under the charge of the prisoner guard, and is responsible to the commander of the guard for their security.

l. He will keep the keys of the guardroom and cells in his personal possession while at the guardhouse. (See par. 16–27*b*.) Should he leave the guardhouse for any purpose he will turn them over to the p. o. who takes his place.

m. He will see that no unauthorized articles are conveyed to the prisoners.

n. He forms the guard whenever a formation is necessary. (See Sec. IV.)

16–19. P. o. of the guard.—*a.* A p. o. of the guard receives and obeys orders only from the commanding officer, field officer of the day, officer of the day, and officers and senior petty officers of the guard.

b. Immediately after the division of the guard into reliefs the petty officers will assign the members of their respective reliefs to posts by number. Such assignment will not be changed during the same tour of guard duty except by direction of the commander of the guard or higher authority. P. os. of the guard should assign the most experienced men to posts at the guardhouse and at remote or responsible places.

c. Each p. o. will then make a list of the members of his relief, including himself. This list will show the number of the relief, the post to which each member is assigned, and his name and organization. The list will be made in duplicate, one copy given to the c. p. o. of the guard as soon as completed and the other retained by himself.

d. It is the duty of the p. o. of the guard to post and relieve sentinels and to instruct the members of his relief regarding their orders and duties. Each p. o. will thoroughly acquaint himself with all the special orders of every sentinel of his relief and see that each understands and correctly transmits such orders *in detail* to his successor. When the countersign is used, the p. o. at the posting of the relief during whose tour challenging is to begin gives the countersign to the members of his relief except to sentinels posted at the guardhouse.

e. He at once reports to the commander of the guard any violation of regulations or any unusual occurrence which is reported to him by a sentinel or which comes to his notice in any other way.

f. There should be at least one petty officer constantly on the alert at the guardhouse, usually the p. o. whose relief is on post. This p. o. will take post near the entrance of the guardhouse and will not fall in with the guard when it is formed. He will have his rifle or other prescribed arm constantly with him. Whenever it becomes necessary for the p. o. to leave his post near the entrance of the guardhouse, he will notify the c. p. o. of the guard, who will at once take his place or designate another p. o. to do so. (See par. 16–18*h*.) He will see that no person without authority enters the guardhouse or crosses the posts of the sentinels there posted.

g. Should any sentinel call for the p. o. of the guard he will go at once to such sentinel. Should the sentinel call "The guard," the p. o. will promptly notify the commander of the guard. (See par. 16–17*e*.) Should the sentinel call "Relief," the p. o. will go to the post of such sentinel, taking with him the man next for duty on that post. If the sentinel is relieved for a short time only, the p. o. will again post him as soon as the necessity for his relief ceases.

h. Should the guard be turned out, each p. o. will call his own relief and cause its members to fall in promptly. Tents or bunks in the same vicinity are designated for the reliefs so that all members of each relief may be found and turned out by the p. o. in the shortest time and with least confusion.

i. He will wake the p. o. whose relief is next on post in time for the latter to verify the prisoners, form his relief, and post it at the proper hour. The relief is formed and posted as prescribed in paragraph 16–28*a*.

j. When the p. o. while posting his relief is challenged by a sentinel, the p. o. commands: 1. **Relief**, 2. **HALT**. To the sentinel's challenge he answers "Relief." At the order of the sentinel he advances alone to give the countersign or to be recognized. When the sentinel says "Advance relief" the p. o. commands: 1. **Forward**, 2. **MARCH**. If to be relieved the sentinel then is relieved as prescribed in paragraph 16–28*a*.

k. Between retreat and reveille the p. o. of the guard will challenge all suspicious-looking persons or parties he may observe, first halting his patrol or relief if either be with him. He will advance such persons or parties in the same manner as do sentinels on post. (See par. 16–32*j*.)

l. Between retreat and reveille, whenever directed by an officer entitled to inspect the guard, the p. o. will call "Turn out the guard," announcing the title of the officer. Then, if not otherwise ordered, he will salute and return to his post.

m. He will advance parties approaching the guard at night in the same manner that sentinels on posts advance like parties. Thus No. 1 at the guardhouse challenges and repeats the answer to the corporal as prescribed hereafter. (See par. 16–33 *a*.) The p. o. advancing (at port arms), says "Advance (so-and-so) with the countersign," or "To be recognized," if there be no countersign used. The countersign being correctly given or the party being duly recognized, the p. o. says "Advance (so-and-so)" repeating the answer to the challenge of the sentinel. When officers of different rank approach the guardhouse from different directions at the same time, the senior will be advanced first.

n. The p. o. will examine persons or parties halted and detained by the sentinel. If he has reason to believe they have no authority to cross the sentinel's post he will conduct them to the commander of the guard.

o. On a naval reservation or in a post the p. o. of the guard will arrest all suspicious looking characters, all disturbers of the peace, and all persons taken in the act of committing crime against the Government. All persons arrested by p. o. of the guard or by sentinels are at once conducted to the commander of the guard by the p. o.

16–20. Buglers of the guard.—*a.* As many buglers of the guard will be detailed as the commanding officer may direct.

b. The buglers of the guard will remain at the guardhouse during their tour unless otherwise directed by the commanding officer.

c. The buglers of the guard sound calls as prescribed by the commanding officer.

d. When the guard is turned out for national or regimental colors or standards the buglers of the guard sound *To the Color* (*standard*) when the guard presents arms, or if turned out by any person entitled thereto, the march or flourishes prescribed in chapter 5 United States Navy Regulations.

16–21. Nonrated men of the guard.—*a.* Nonrated men are assigned to reliefs by the commander of the guard and to posts by the p. os. of their reliefs. Nonrated men are not changed from one relief to another during the same tour of duty except by proper authority.

b. Nonrated men of the guard must be familiar with the general orders for sentinels and with all special orders applying to their particular posts.

c. No. 1 at the guardhouse is directly charged with guarding the prisoners except when they have been turned over to the prisoner guard.

(1) *He will allow none to escape.*

(2) *He will allow none to cross his post from the guardhouse except when passed by an officer or petty officer of the guard.*

(3) *He will allow no one to communicate with prisoners without permission from proper authority.*

(4) *He will promptly report to the p. o. of the guard any suspicious noise made by the prisoners.*

(5) *He will be prepared to tell whenever asked how many prisoners are in the guardhouse and how many are at work or elsewhere.*

(6) *Whenever prisoners are brought to his post he will halt them and call "Petty officer of the guard (so many) prisoners."*

(7) *He will not allow prisoners to pass into the guardhouse until the p. o. of the guard has responded to the call and ordered him to do so.*

d. Whenever the guard or a relief is dismissed, each member not at once required for duty will place his rifle, if so armed, in the arm rack or stack and will not remove it therefrom unless required in the performance of some duty.

e. Without permission from the commander of the guard, members of the main guard, except orderlies, will not leave the immediate vicinity of the guardhouse. Permission to leave will not be granted except in cases of necessity.

f. Members of the main guard except orderlies will not remove their equipment or clothing without permission from the commander of the guard.

16–22. Orderlies.—*a.* When so directed by the commanding officer, the officer who inspects the guard at guard mounting will select from the members of the new guard an orderly for the commanding officer and such number of other orderlies and color sentinels as may be required. For these positions the men will be chosen who are most correct in the performance of duty and in military bearing, neatest in person and clothing, and whose arms and equipment are in the best condition. Clothing, arms, and equipment must conform to regulations. If there is any doubt as to the relative qualifications of two or more men, the inspecting officer will cause them to fall out at the guardhouse and form in line in single rank. He will then select the most proficient by testing them in drill. The commander of the guard will be notified of the selection.

b. When directed by the commander of the guard to fall out and report, an orderly will give his name, company, and regiment to the p. o. of the guard and, leaving such arms and equipment at his quarters as are not specified in the equipment for orderlies, will proceed at once to the officer to whom he is assigned, reporting, as for example, "Sir Seaman (so-and-so), Company, (so-and-so) reports as orderly."

c. Orderlies while on duty as such are subject only to the orders of the commanding officer or of the officer to whom they are ordered to report.

d. When an orderly is ordered to carry a message he must be careful to deliver it exactly as it was given him.

e. His tour of duty ends when he is properly relieved by the orderly selected from the guard relieving his own.

f. Orderlies are members of the guard and their names and organizations are entered on the guard report and lists of the guard.

16–23. Color sentinels.—Guards may be furnished for the colors when unfurled and posted out of doors. For this purpose guards are detailed and governed by the same regulations as apply to other members of the main guard.

Section IV.—FORMATIONS

16–24. Under arms.—*a.* At all formations the guard forms under arms.

b. Members of the guard, or reliefs upon forming, execute inspection arms as prescribed in the Landing Force Manual.

16–25. When turned out.—When the guard is turned out its formation is as follows: The post of the senior petty officer, if commander of the guard, is the same as in the case of an officer. If not commander of the guard it is in the line of file closers and in rear of the right file of the guard. The next in rank is right guide, the next left guide, the others in the line of file closers, each p. o. being usually in rear of his relief. The buglers are 3 paces to the right of the guard. The reliefs form in the same order as when the guard was first divided.

16–26. To form the guard.—*a.* When the guard is turned out the 1. p. o. takes position 3 paces in front of where its center is to be and faces it. The right guide places himself so that when formed the center of the guard will be oppo-

site to and 3 paces from the 1. p. o. When the guard is formed the 1. p. o. commands: 1. **Inspection**, 2. **ARMS (PISTOLS)**, 3. **Right shoulder**, 4. **ARMS**, (3. **Return**, 4. **PISTOLS**), and calls the roll. Each man as his name is called answers "Here" (and if armed with rifle executes **Order arms**). The guard is not divided into platoons or sections. Squads do not count off except when the guard is formed prior to marching off.

b. The 1. p. o. then faces about and reports "Sir, all present or accounted for," "Sir, (so-and-so) absent," or if the roll has not been called, "Sir, the guard is formed," and without command takes his post.

c. The commander of the guard places himself 6 paces in front of and facing the guard in time to receive the report of the 1. p. o.

At night the roll may be called by reliefs and numbers instead of by names. Thus, the first relief being on post: *Second relief, p. o., No. 1; No. 2; etc.: Third relief, p. o.; No. 1; No. 2; etc.*

d. Roll call may be omitted except when forming the guard for an officer entitled to inspect it unless he otherwise directs. The roll will be called prior to the dismissal of the guard if omitted when it is formed.

e. If the 1. p. o. is also commander, he forms the guard as c. p. o. of the guard and then takes post and proceeds as commander of the guard.

16–27. To parade prisoners.—*a.* Prisoners, when paraded with the guard, are placed in line in its center.

b. The c. p. o. immediately before forming the guard will turn over his keys to the p. o. at the guardhouse. Having formed the guard he divides it into two nearly equal parts. Indicating the point of division with his hand he commands: 1. **Right (left) of guard**, 2. **Right (left)**, 3. **FACE**, (4. **At trail**), 5. **Forward**, 6. **MARCH**, 7. **Guard**, 8. **HALT**, 9. **Left (right)**, 10. **FACE**. If the first command is **Right face**, only the right half of the guard executes the movements; if **Left face**, only the left half executes them. The command **Halt** is given when sufficient interval has been obtained to admit the prisoners. The doors of the guardroom and cells are then opened by the p. o., having the keys. The prisoners file out under the supervision of the c. p. o., the p. o. and sentinels on duty at the guardhouse, and such other sentinels as may be necessary. They form in line in the interval between the two parts of the guard.

c. To return the prisoners to the guardroom and cells the c. p. o. commands: 1. **Prisoners**, 2. **Right (left)**, 3. **FACE**, 4. **Column right (left)** 5. **MARCH**.

The prisoners under the same supervision as before return to their proper rooms or cells.

To close the guard the c. p. o. commands: 1. **Right (left) of guard**, 2. **Left (right)**, 3. **FACE**, (4. **At trail**), 5. **Forward**, 6. **MARCH**, 7. **Guard**, 8. **HALT**, 9. **Right (left)**, 10. **FACE**.

Only the right or left half of the guard, as indicated, executes the movement.

If there are but few prisoners, the c. p. o. indicates the point of division as above and may form the necessary interval by the commands: 1. **Right (left) of guard**, 2. **Right (left) step**, 3. **MARCH**, 4. **Guard**, 5. **HALT**, and close it by the commands: 1. **Right (left) of guard**, 2. **Left (right) step**, 3. **MARCH**, 4. **Guard**, 5. **HALT**.

d. To receive the prisoners at the guardhouse when they have been paraded and after they have been verified by the officers of the day, the commander of the new guard directs his c. p. o. to form his guard with an interval, and commands: 1. **Prisoners**, 2. **Right**, 3. **FACE**, 4. **Forward**, 5. **MARCH**. The prisoners having arrived opposite the interval in the new guard, he commands: 1. **Prisoners**, 2. **HALT**, 3. **Left**, 4. **FACE**, 5. **Right (left)**, 6. **DRESS**, 7. **FRONT**. The prisoners dress on the line of the new guard.

16–28. To post reliefs.—*a.* When directed by the commander of the guard, the p. o. of the first relief forms his relief. The men place themselves according to the numbers of their respective posts, viz: *Two, four, six,* and so on, in front rank and *one, three, five,* and so on, in the rear rank. At the command **Call off** the men call off numerically, alternating rear and front rank, *one, two, three, four,* and so on. If in single rank they call off from right to left. The p. o. then commands: 1. **Right**, 2. **FACE**, 3. **Forward**, 4. **MARCH**. The p. o. marches on the left and near the rear file in order to observe the march. The p. o. of the old guard marches on the right of the leading file and takes command when the last one of the old sentinels is relieved, changing places with the p. o. of the new guard.

When the relief arrives at 6 paces from a sentinel, the p. o. halts it and commands, according to the number of the post: **No.** (—). The new sentinel approaches the old, halting about 1 pace from him. Both sentinels execute port

arms unless armed only with the pistol. In the latter case, during the time for challenging, they execute raise pistol, and at other times leave pistols in holsters and stand at attention.

The p. os. advance and place themselves facing each other a little in advance of the new sentinel, the old p. o. on his right, the new on his left (and remain at right shoulder arms). They see that the old sentinel transmits correctly his instructions. Figure 224 illustrates the positions.

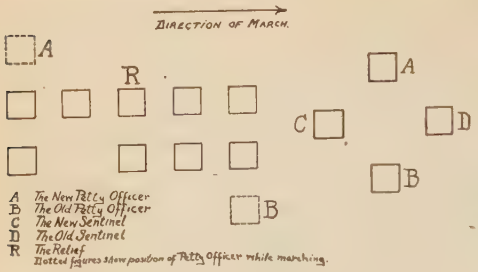

FIG. 224.—To post reliefs

The instructions relative to the post having been transmitted, the new p. o. commands: **POST.** Both sentinels then (resume right shoulder arms) face toward the new p. o. and step back to allow the relief to pass in front of them. The new p. o. then commands: 1. **Forward**, 2. **MARCH.** The old sentinel takes his place in the rear of the relief as it passes him, his piece in the same position as those of the relief. The new sentinel stands fast (at right shoulder arms) until the relief has passed 6 paces beyond him, when he walks his post. The p. os. take their places as the relief passes them. On the return of the old relief the p. o. of the new guard falls out when the relief halts. The p. o. of the old guard forms his relief on the left of the old guard if it has been held at the guardhouse, salutes, and reports to the commander, "Sir, the relief is present," or "Sir, (so-and-so) absent," and takes his place in the guard. In case the old guard was not held at the guardhouse, the p. o. marches his relief to the quarters of the members thereof and reports their presence to the p. o. in charge of such quarters.

b. To post a relief other than that which is posted when the old guard is relieved, its p. o. commands: 1. **Such relief**, 2. **FALL IN.** If arms are stacked they are taken at the proper commands.

The p. o., standing 2 paces in front of the center of his relief, then commands: **CALL OFF.** The men call off as prescribed. The p. o. then commands: 1. **Inspection**, 2. **ARMS (PISTOLS)** (if arms are to be loaded the proper commands are here given), 3. **Order**, 4. **ARMS** (3. **Return**, 4. **PISTOLS**). The p. o. then reports to the commander of the guard that his relief is all present and ready to be posted, or that (so-and-so) is absent.

When the commander of the guard directs the p. o. "Post your relief," the p. o. salutes and posts his relief as prescribed in subparagraph *a*.

The p. o. of the relief on post does not go with the new relief except when necessary to show the way.

c. If sentinels are numerous, reliefs may by authority of the commanding officer be posted in detachments.

d. Mounted sentinels are posted and relieved in accordance with the same principles.

16–29. To dismiss reliefs.—*a.* To dismiss the old relief, it is halted and faced to the front at the guardhouse by the p. o. of the new relief who then falls out. The p. o. of the old relief then steps in front of the relief and dismisses it by the proper commands.

b. If arms were loaded before the relief was posted, the p. o. will see that no cartridges are left in the chambers or magazines before dismissing the relief. The same rule applies to sentinels over prisoners.

Section V.—ORDERS

16–30. Orders for sentinels.—Orders for sentinels are of two classes: General orders and special orders. General orders apply to all sentinels. Special orders relate to particular posts and duties.

16–31. General orders.—All sentinels are required to memorize the following:

My general orders are—

1. *To take charge of this post and all Government property in view.*
2. *To walk my post in a military manner, keeping always on the alert and observing everything that takes place within sight or hearing.*
3. *To report all violations of orders I am instructed to enforce.*

4. *To repeat all calls from posts more distant from the guardhouse than my own.*
5. *To quit my post only when properly relieved.*
6. *To receive, obey, and pass on to the sentinel who relieves me all orders from the commanding officer, field officer of the day, officer of the day, and officers and petty officers of the guard only.*
7. *To talk to no one except in line of duty.*
8. *To give the alarm in case of fire or disorder.*
9. *To allow no one to commit a nuisance on or near my post.*
10. *To call the petty officer of the guard in any case not covered by instructions.*
11. *To salute all officers, and all colors and standards not cased.*
12. *To be especially watchful at night and, during the time for challenging, to challenge all persons on or near my post, and to allow no one to pass without proper authority.*

16–32. Regulations relating to the general orders.—*a.* No. 1: *To take charge of this post and all Government property in view.*—All persons of whatever rank in the service are required to respect sentinels and members of the guard in the performance of their duties.

A sentinel will report immediately to the p. o. of the guard every unusual or suspicious occurrence noted.

He will arrest all suspicious persons, all parties involved in a disorder occurring on or near his post, and all who attempt to enter the post at night except authorized persons. He will turn over to the p. o. of the guard all persons arrested.

The number, limits, and extent of his post will invariably constitute part of the special orders of a sentinel. The limits of his post will be so defined as to include every place to which he is required to go in the performance of his duties.

b. No. 2: *To walk my post in a military manner, keeping always on the alert and observing everything that takes place within sight or hearing.*—A sentinel is not required to halt and change the position of his rifle on arriving at the end of his post, nor execute **To the rear march** precisely as prescribed in the Landing Force Manual, but faces about while walking, in the manner most convenient to him, and at any part of his post best suited to the proper performance of his duties.

He carries his rifle on either shoulder, and when exposed to wet or severe weather may carry it in a position to best protect it.

Sentinels when in sentry boxes stand at ease. Sentry boxes will be used in wet weather only, or at times when specially authorized by the commanding officer.

In very hot weather sentinels may be authorized to stand at ease on their posts provided they can effectively discharge their duties in this position, but they will take advantage of this privilege only on the express authority of the officer of the day or the commander of the guard.

c. No. 3: *To report all violations of orders I am instructed to enforce.*—A sentinel will report a violation of orders when he is inspected or relieved. If the case is urgent he will call the p. o. of the guard and also arrest the offender, if necessary.

d. No. 4: *To repeat all calls from posts more distant from the guardhouse than my own.*—To call the p. o. of the guard for any purpose other than relief, fire, or disorder (see subpars. *e* and *h*), a sentinel will call "p. o. of the guard No. (—)." In no case should any sentinel call "Never mind the petty officer," nor will the p. o. heed such call if given.

e. No. 5: *To quit my post only when properly relieved.*—If relief becomes necessary by reason of sickness or other cause, a sentinel will call "p. o. of the guard, No. (—), relief."

Whenever a sentinel is to be relieved he will halt and, with rifle at right shoulder arms, face toward the relief when it is 30 paces from him. He will come to port arms with the new sentinel, and in a low tone transmit to him all the special orders relating to the post and any other information which will assist him to better perform his duties. If armed only with pistol, he will, while being relieved, hold same at raise pistol only during the hours for challenging. (See par. 16–28 *a.*)

f. No. 6: *To receive, obey, and pass on to the sentinel who relieves me all orders from the commanding officer, field officer of the day, officer of the day, and officers and petty officers of the guard only.*—During his tour of duty a sentinel is subject to the orders of the commanding officer, field officer of the day, officer of the day, and officers and petty officers of the guard only; but any officer is competent to investigate apparent violations of regulations by members of the guard.

A sentinel will quit his piece only on an explicit order from a person from whom he lawfully receives orders while on post. Unless necessity therefor

exists, no person will require a sentinel to quit his piece, or even require it to be inspected.

A sentinel will not divulge the countersign to any one except the sentinel who relieves him, or to a person from whom he properly receives orders on such persons's verbal order given personally. Nonrated men of the guard will not use the countersign except in the performance of their duties while posted as sentinels.

g. No. 7: *To talk to no one except in line of duty.*—When persons make proper inquiries of a sentinel, courteous answers should be given. When calling for any purpose, challenging, or holding conversation with any person, a sentinel armed with a rifle will take the position of port arms. At night a sentinel armed with a pistol takes the position of raise pistol in challenging or holding conversation.

h. No. 8: *To give the alarm in case of fire or disorder.*—In case of fire the sentinel will call "Fire, No. (—)." If possible, he will extinguish the fire. In case of disorder, he will call "The guard, No. (—)." In either case, if the danger is great, he will discharge his piece three times in rapid succession before calling.

i. No. 11: *To salute all officers, and all colors and standards not cased.*—(1) When not engaged in the performance of a specific duty the proper execution of which would prevent saluting, a member of the guard will salute all persons as provided in subparagraph (3). This rule applies at all hours of the day or night except in the case of sentinels armed with a pistol, who do not salute after challenging. (See subpar. (2).)

(2) Sentinels will salute as follows: A dismounted sentinel armed with a rifle salutes by presenting arms; if otherwise armed he salutes with the right hand. In a sentry box, armed with a rifle, he stands at attention in the doorway on the approach of a person or party entitled to the salute and salutes by presenting arms.

On a regular post he halts and salutes. If doing patrol duty, he salutes, but does not halt unless spoken to. A sentinel armed with a pistol, does not salute after challenging. He stands at advance rifle or raise pistol until the challenged party has passed.

(3) Sentinels salute all persons and parties entitled to the compliment from the guard (see par. 16–37 *c*) and other officers of the Regular Army, Navy, and Marine Corps, officers of the National Guard and Organized Reserves when in uniform, and military and naval officers of foreign powers.

A sentinel salutes as an officer comes on his post. If the officer holds conversation with him, he again salutes when the officer leaves.

During the hours when challenging is prescribed the first salute is given as soon as the officer has been duly recognized and advanced.

A sentinel in conversation with an officer will not interrupt the conversation to salute, but in case the officer salutes a senior the sentinel will also salute.

(4) When the flag is being lowered at retreat, a sentinel on post and in view of the flag faces it at the first note of the national anthem or to the color, stands at attention, and renders the prescribed salute. At the cessation of the last note he resumes walking his post.

(5) When an armed party of the guard approaches, the sentinel halts when it is about 30 paces from him and faces toward it (with his rifle at right shoulder arms). If he is not to be relieved, he will, as the party passes, place himself so that it will pass in front of him, and resume walking his post when it has passed 6 paces beyond him.

j. No. 12: *To be especially watchful at night and, during the time for challenging, to challenge all persons on or near my post, and to allow no one to pass without proper authority.*—(1) During challenging hours, if a sentinel sees any person or party on or near his post, he will advance rapidly along his post toward such person or party, and when within about 30 paces will challenge sharply: **HALT! Who is there?** He then places himself in the best possible position to receive or arrest the person or party.

In case a mounted person or party is challenged the sentinel will call: **HALT! DISMOUNT! Who is there?**

The sentinel will permit only one of the party to approach him for the purpose of giving the countersign, or, if no countersign is used, of being duly recognized. When recognition of a friend has been made, the whole party will be advanced.

The sentinel must satisfy himself beyond a reasonable doubt that those challenged are what they represent themselves to be and have a right to pass. If he is not satisfied, if he has no authority to pass persons with the countersign, or if no countersign—or an incorrect one—is given, he causes them to wait in place and calls the D. O. of the guard.

When a party approaches, the sentinel, on receiving an answer that indicates that some one in the party has the countersign, will say "Advance one with the countersign," and if the countersign is given correctly will then say "Advance (so-and-so)," repeating the answer to his challenge. Thus, if the answer be "Relief (friends with the countersign, patrol, etc.)," the sentinel will say "Advance one with the countersign"; then, "Advance relief (friends, patrol, etc.)."

If a person having the countersign approaches alone, he will be advanced to give the countersign. Thus, if the answer is "Friend with the countersign (officer of the day, etc.)," the sentinel will call "Advance with the countersign." After the countersign has been given he will say "Advance, friend (officer of the day, etc.)."

(2) If two or more persons or parties approach the sentinel's post from different directions at the same time, they will be challenged in turn and required to halt and remain halted until advanced.

The senior is first advanced in accordance with the foregoing rules.

If a person or party is already advanced and in conversation with a sentinel, the latter will challenge any other person or party that may approach. If the person or party challenged is senior to the one already on his post, the sentinel will advance the new person or party at once. The senior may allow him to advance any or all others that may be challenged; otherwise the sentinel will advance none until the senior leaves him. He will then advance only the senior of the remaining ones, and so on.

The following order of rank governs a sentinel in advancing different persons or parties approaching the post: Commanding officer, field officer of the day, officer of the day, officer of the guard, officers, patrols, reliefs, petty officers of the guard in order of rank, and friends.

(3) A sentinel must never allow himself to be surprised nor permit two parties to advance upon him at the same time.

(4) If no countersign is used, the rules for challenging are the same. The rules for advancing are modified only to the extent of substituting the words "To be recognized" for the words "With the countersign."

(5) Answers to a sentinel's challenge intended to confuse or mislead him are prohibited, but the use of such an answer as "Friend with the countersign" is not to be understood as misleading, but as the usual answer made by officers or patrols when the purpose of their visit makes it desirable that their official capacity should not be announced.

16–33. Special orders for the sentinel at the guardhouse (No. 1).—*a.* The sentinel at the guardhouse (No. 1) is required to memorize the following:

(1) *Between reveille and retreat to turn out the guard for all persons designated by the commanding officer, for all colors and standards not cased, and for all armed parties approaching my post except troops at drill and reliefs and detachments of the guard.*

(2) *At night, after challenging any person or party, to advance no one, but call the petty officer of the guard, repeating the answer to the challenge.*

b. After receiving an answer to his challenge, the sentinel calls, "Petty officer of the guard (so-and-so)," repeating the answer to the challenge.

He does not in such cases repeat the number of his post. He remains in the position assumed in challenging until the p. o. has recognized or advanced the person or party challenged, when he resumes walking his post. If the person or party is entitled to the salute, he salutes and resumes walking his post as soon as the salute has been acknowledged.

c. The sentinel is notified by direction of the commanding officer of the presence in the post of persons entitled to the compliment from the guard.

d. The following examples illustrate the manner in which the sentinel at the post of the guard turns out the guard upon the approach of persons or parties entitled to the compliment (see par. 16–37c): "Turn out the guard, national color (governor of the State, general officer, officer of the day, etc.)."

At the approach of a new guard at guard mounting the sentinel will call "Turn out the guard, armed party." This also applies in the case of the approach of a military funeral.

If the person named by the sentinel does not desire the guard formed, he will salute, whereupon the sentinel will call "Never mind the guard."

After having called "Turn out the guard, armed party," the sentinel will never call "Never mind the guard."

If the guard is already formed he will not fail to call "Turn out the guard," as required in his special orders except that the guard is not turned out for any person while his senior is at or coming to the guardhouse.

e. In case of fire or disorder or the presence of suspicious or disorderly persons in the vicinity of his post, the sentinel will call the p. o. of the guard and report the facts to him. (See par. 16–19o.)

Section VI.—PRISONERS AND PRISONER GUARDS

16–34. Rules governing prisoners.—United States Navy Regulations, chapter 4, contain the rules for confinement and discipline of and responsibility for prisoners.

16–35. Confinement and release of prisoners.—*a.* A prisoner, after his first day of confinement and until his sentence has been duly promulgated, is considered as held in confinement by the commanding officer. After promulgation of his sentence the prisoner is held in confinement by authority of the officer who reviews the proceedings of the court awarding the sentence.

b. No general court-marshal prisoner will be released from confinement except on an order communicated by the commanding officer. Garrison (summary court-martial) prisoners will be released as provided in paragraph 16–16*j*.

16–36. Prisoner guards.—*a.* Prisoner guards are normally detailed in the same manner as members of the main guard for the particular duty of guarding working parties of prisoners.

b. When no prisoner guard has been detailed the commander of the guard assigns as guards over working parties of prisoners sentinels from posts guarded at night only.

c. Details for prisoner guard are marched to the guardhouse and mounted by being inspected by the commander of the main guard who sees that all of the men are properly armed and equipped and in condition to perform their duties.

d. The provost petty officer is 1. p. o. of the prisoner guard and as such receives orders from the commanding officer and the commander of the prisoner guard only.

e. When the prisoners have been turned over to the prisoner guard, such guards are responsible for them under their commander, and all responsibility and control of the main guard ceases until they are returned to the main guard.

f. If a prisoner attempts to escape, the sentinel or any member of the main guard or prisoner guard who sees him will call **HALT!** If the prisoner fails to halt when the sentinel has once repeated his call and if there is no other possible means of preventing his escape the sentinel will fire at him.

g. Members of the prisoner guard placed over prisoners for work will receive specific and explicit instructions covering the required work. They will be responsible that the prisoners under their charge properly and satisfactorily perform the designated work.

h. On approaching the post of No. 1 at the guardhouse a sentinel of the prisoner guard in charge of prisoners will halt them and call "No. 1 (so many) prisoners." He will not allow them to cross the post of the sentinel until so directed by the p. o. of the guard.

i. A prisoner does not salute.

Section VII.—COMPLIMENTS, SALUTES, RAISING AND LOWERING THE FLAG

16–37. Compliment from a guard.—*a.* The compliment from a guard consists in the guard turning out and presenting arms. No compliment from a guard is paid between retreat and reveille.

b. Though a guard does not turn out between retreat and reveille as a matter of compliment, it may be turned out at any time for inspection by a person entitled to inspect it or as a precaution of security.

c. The guard will pay the compliment—

(1) When the national or regimental color or standard, not cased, is carried past the guardhouse by a guard or an armed party. This rule also applies when the party carrying the color or colors is at drill. If the drill is conducted in the vicinity of the guardhouse the guard will be turned out when the color or colors first pass and not thereafter.

(2) To the remains of a deceased officer or man passing the guardhouse.

(3) Upon the approach of armed parties except troops at drill and reliefs and detachments of the guard.

(4) The following persons are entitled to the compliment: The President, an ex-President, the Vice President, the President of a foreign republic, a foreign sovereign, a member of a reigning royal family, members of the cabinet, the

President pro tempore of the Senate, American or foreign ambassadors, the Chief Justice, the Speaker of the House of Representatives, the governors within their respective States or Territories or a governor general and the civil governor of the Philippine Islands, the Assistant Secretary of War, American or foreign envoys or ministers, general officers of the Regular Army, general officers of foreign services, officers of the Navy of the relative rank of general officer, general officers of the Marine Corps, general officers of the National Guard and Organized Reserves in the active service of the United States, commanding officers of brigades, artillery districts, coast defense commands, or posts within their respective commands, field officer of the day, and officer of the day.

d. Guards will not be turned out on Sundays as a matter of compliment for officers of the Army of the United States, or the United States Navy, or Marine Corps.

16–38. Notice of presence of distinguished persons.—The commander of the guard will be notified of the presence in the post of all persons entitled to the compliment, except such as are habitually there, and sentinels will be advised accordingly.

16–39. Salutes and reports.—*a.* Between reveille and retreat when the guard has been turned out for any person entitled to the compliment the commander of the guard, if an officer, receives the report of the c. p. o., returns the salute, draws his sword, and places himself 3 paces in front of the center of the guard. When the person for whom the guard has been turned out approaches, the commander of the guard salutes if the guard is not armed with rifles. If it is armed with rifles he faces the guard and commands: 1. **Present**, 2. **ARMS**, then faces to the front and salutes, and when his salute has been acknowledged, resumes carry sword, faces about, commands: 1. **Order**, 2. **ARMS**, and faces to the front.

b. If the guard is turned out for an officer entitled to inspect it, after saluting (and before bringing the guard to order arms), the commander of the guard reports "Sir, all present or accounted for;" or "Sir, (so-and-so) absent;" or, if the roll call has been omitted, "Sir, the guard is formed."

c. Between retreat and reveille the commander of the guard salutes and reports but does not bring the guard to present arms.

d. To those entitled to have the guard turned out, but not entitled to inspect it, no report is made; nor is a report made to any officer unless he halts in front of the guard.

e. When a guard commanded by a petty officer is turned out as a compliment or for inspection, he takes post as prescribed for an officer and renders the proper salute according as he is armed.

f. After any person has received or declined the compliment or received the salute from the commander of the guard with the guard at attention, official recognition of his presence thereafter, while he remains in the vicinity, will be taken by bringing the guard to attention only.

Raising and Lowering the Flag

16–40. *a.* It is the duty of the commander of the guard to see that the proper flag is hoisted. In case of storm either wind or rain, he will see that a storm-flag is promptly substituted.

b. The flag shall be hoisted at 8 a. m. and lowered at sunset.

c. The national flag will always be displayed at the time of firing salutes. (See also Art, 16–52.)

d. The sentinel at the guardhouse, or the sentinel nearest the flagstaff, will report at once to the p. o. of the guard any danger to the flag, from loosened halyards or from entanglement with either halyards or staff.

e. When practicable, a detail consisting of a p. o. and two men of the guard will hoist or lower the flag. This detail is formed in line, with side arms, or if the special equipments do not include side arms, then with belts only, the p. o. carrying the flag, in the center, and is marched to the staff. The flag is then securely attached to the halyards and is rapidly hoisted at the sounding of the first note of the National Anthem or of the bugle, if no band be present. The halyards are then securely fastened to the cleat on the staff. The detail will salute the colors as required by the Navy Regulations.

f. When the flag is to be lowered, the halyards are cast off from the staff and made perfectly free. At sunset the flag is slowly lowered, so as to reach the ground at the sounding of the last note of the National Anthem or the "color's" call, as the case may be. It is then neatly made up and the halyards fastened

The detail is then re-formed and marched to the guardhouse, where the flag is turned over to the commander of the guard.

g. When the flag is displayed at half-mast it is first hoisted to the top of the mast and then lowered to the half-mast position. Before hauling down the flag for the day it is again mastheaded. A flag in any position below the masthead is technically in the half-mast position. When lowered from the mast no portion of it will be allowed to touch the ground, either in lowering or folding.

Section VIII.—COUNTERSIGNS AND PAROLES

16–41. Countersign.—The countersign is a word given daily from the principal headquarters of a command to aid guards and sentinels in identifying persons who may be authorized to pass at night.

Any person subject to military law who makes known the parole or countersign to any person not entitled to receive it according to the rules and discipline of war, or gives a parole or countersign different from that which he received, shall, if the offense be committed in time of war, suffer death or such other punishment as a court-martial may direct. (See par. 16–32 *f.*)

16–42. To whom given.—The countersign is given to such persons as may be authorized to pass sentinels' posts during the night and to officers, petty officers, and sentinels of the guard except those at the guardhouse.

16–43. Parole.—The parole is a word used as a check on the countersign in order to obtain more accurate identification of persons.

16–44. To whom given.—The parole is given only to those who are entitled to inspect guards and to commanders of guards. When the commander of the guard demands the parole he will advance and receive it in the same manner that the p. o. receives the countersign. (See par. 16–19 *m.*)

16–45. How selected.—The countersign is usually the name of a battle; the parole that of an admiral or other distinguished person.

16–46. Sent sealed.—*a.* The parole or countersign or both are distributed sealed in the form of an order.

b. When they can not be communicated daily, a series of words for some days in advance may be sent to posts or detachments that are to use the same parole or countersign as the main body.

16–47. Action if lost.—If the countersign is lost, or if a member of the guard deserts with it, the commander on the spot will substitute another for it and report the circumstances at once to headquarters.

16–48. Necessity for personal recognition.—Because the communications containing the parole and countersign must at times be distributed by many messengers, the parole intrusted to many officers, and the countersign and parole to many officers and sentinels, and because both the countersign and parole for large commands must be prepared several days in advance, there is always danger of both these words being lost or becoming known to persons who would make improper use of them. Moreover, a sentinel is too apt to take it for granted that any person who gives the right countersign is what he represents himself to be. The chief reliance will be upon personal recognition or identification of all persons claiming authority to pass. Persons whose sole means of identification is the countersign or concerning whose authority to pass there is a reasonable doubt, will not be allowed to pass without the authority of the p. o. of the guard who will make thorough investigation. The p. o. conducts to his next superior any person about whom he is unable to decide.

16–49. Use of signals.—In addition to the countersign, use may be made of preconcerted signals, such as striking the rifle with the hand, whistling to simulate a bird, etc. Such signals will be used only by guards that occupy exposed points. They are used before the countersign is given and will only be communicated to those entitled to know the countersign. Their use is intended to prevent the surprise of a sentinel. In the daytime, signals such as raising a cap or a handkerchief in a prearranged manner may be used by sentinels to communicate with the guard or with each other.

Section IX.—MISCELLANEOUS

16–50. Guard patrols.—A guard patrol consists of one or more men detailed for the performance of some special service connected with guard duty such as patrolling a certain portion of the post, or looking for escaped prisoners.

16–51. Watchmen.—*a.* Enlisted men may be detailed as watchmen and as such receive their orders and perform their duties as the commanding officer may direct.

b. When enlisted men are thus employed, they are formed into one or more detachments under the command of a petty officer and with sufficient petty officers to function independently. The commanding officer makes such rules for the watchmen system as will meet the requirements of the post. Tours of not longer than 6 or 8 hours, with change of posts not oftener than every 6 days, may be considered normal. Sufficient supernumeraries must be provided so that watchmen will be off duty one day in each seven. Old and experienced men should be used for this service.

16–52. Saluting gun.—The morning and evening salutes are fired by a detachment of the guard consisting of one petty officer and two men. The petty officer marches the detachment to and from the gun, which is fired and sponged out under his direction. The morning gun is fired at the first note of the reveille, or, if marches be played before the reveille, it is fired at the commencement of the first march. The retreat gun is fired at the last note of the retreat.

16–53. Extra orders to commander of the guard.—All material instructions given to a member of the guard by an officer having authority to do so will be promptly communicated to the commander of the guard by the officer giving them.

Section X.—EXTERIOR GUARDS

General Principles

For more detailed instructions in placing outposts see Army Combat Principles in Part III.

16–54. Security embraces all of those measures taken by a command to protect itself from observation or surprise by the enemy. This is obtained by covering the immediate front of the command with detachments.

In camp or bivouac these detachments are called **outposts.** On the march they are called **advance, flank,** or **rear guards.**

16–55. As the principal duty of these bodies is the same, there is a general similarity in the formations assumed by them.

There is (1) a group, or line of groups, in observation; then (2) the support, or line of supports, whose duty is to furnish the observation groups and check the enemy pending the arrival of reinforcements; still farther in rear is (3) the reserve. When practicable, the integrity of tactical units is preserved.

In mixed commands infantry usually forms the greater part of the troops detailed to the service of security. The kind and amount of artillery are determined by circumstances.

Troops on the service of security pay no compliments; individuals salute when they address, or are addressed by, a superior officer.

OUTPOSTS

General Considerations

16–56. An outpost is a covering detachment detailed to secure a camp, cantonment, bivouac, or a defensive position against surprise, to prevent an attack upon it before the troops can prepare to resist, and to deny to the enemy observation into their dispositions and movements.

The outpost carries out such reconnaissance as is necessary for the security of the resting troops. When in contact with the enemy, it is responsible that such contact is not lost when the enemy withdraws in front of the position.

16–57. The size and the dispositions of the outpost will depend upon many circumstances, such as the size of the whole command, the proximity of the enemy, and the situation with respect to him, the nature of terrain, etc.

A suitable strength may vary from a very small fraction to one-third of the whole force. For a single company in bivouac, a few sentinels and patrols will suffice; for a large command, a more elaborate outpost system must be provided. It should be no stronger than is consistent with reasonable security.

The most economical protection is furnished by keeping close contact with the enemy by means of outpost patrols, in conjunction with resisting detachments on the avenues of approach.

16–58. In a brigade or smaller force on the march toward the enemy, the outpost is generally formed from the advance guard and is relieved the following day when the new advance guard crosses the line of outguards. In a retreat the detail for outpost duty is generally made from the main body. The new outpost becomes the rear guard the following day.

16–59. When, as in large forces, an advance or a rear guard performs such duty for several days, the outpost during this period is furnished by the advance

or the rear guard, and orders for the establishment of the outpost are issued by the advance or the rear guard commander.

When the command is small and stationary for several days, the outpost is relieved daily. In large commands the outpost will, as a rule, be relieved at intervals of several days. The period of outpost duty will largely depend on the severity of the service.

16–60. The positions held by the subdivisions of the outpost are generally prepared for defense, but conditions may render this unnecessary.

Troops on outpost keep concealed as much as is consistent with the proper performance of their duties; especially do they avoid appearing on the sky line.

16–61. Composition.—A mixed outpost is composed principally of infantry. The infantry is charged with the duty of local observation, especially at night, and with resisting the enemy long enough for the main body to prepare for action.

Artillery is useful to outposts when its fire can sweep defiles or large open spaces and when it commands positions that might be occupied by hostile artillery. The guns are carefully concealed or protected and are usually withdrawn at night.

Machine guns are useful to command approaches and check sudden advances of the enemy.

Pioneers may be attached to an outpost to assist in constructing entrenchments, clearing the field of fire, and opening communications laterally and to the rear.

The supreme commander generally retains control of the signalmen and establishes a line of information to the reserve and from the reserve to each support and important detached post.

Distribution of Outpost Troops

16–62. The outpost will generally be divided into three parts. These, in order from the main body, are the **reserve**, the **line of supports**, and the **line of outguards.**

The distances separating these parts, and their distance from the main body, will depend upon the object sought, the nature of the terrain, and the size of the command. There can be no uniformity in the distance between supports and reserve, nor between outguards and supports, even in the same outpost. The avenues of approach, facilities for observation, and other important features of the terrain will largely control their exact position.

The outpost of a small force should ordinarily hold the enemy beyond effective rifle range of the main body until the latter can deploy. For the same purpose the outpost of a large force should hold the enemy beyond artillery range.

16–63. The **reserve** constitutes the main body of the outpost and is held at some central point from which it can readily *support the troops in front by reinforcement or counterattack or hold a rallying position* on which they may retire. It is generally located near the principal route leading from the enemy.

The reserve may be omitted when the outpost consists of less than two companies.

The reserve may comprise one-fourth to two-thirds of the strength of the outpost.

16–64. The supports constitute the line of **resisting units** of the outpost. They are the principal agencies of security of the outpost. In outposts equalling or exceeding the strength of a battalion, a support is usually constituted by a company.

The supports are numbered consecutively from right to left. They are placed at the more important points on the outpost line, usually on or near the line on which resistance is to be made in case of attack. Supports hold their positions, unless the orders of the outpost commander prescribe otherwise.

16–65. The movement of troops when not engaged in combat is for the most part confined to roads. As a general rule, therefore, roads exercise the greatest influence on the location of supports, and a support will generally be placed on or near a road. The sector which it is to cover is clearly defined by means of tangible lines on the ground and is such that the support is centrally located therein.

Supports insure their own security by means of outguards and patrols.

16–66. The outguards comprise small detachments established by the supports of their own security and for the observation of the sector assigned to them. For convenience, they are classified as **pickets, sentry squads,** and **cossack posts.** They are numbered consecutively from right to left in each support.

Posts at a short distance from the support may be held by weak outguards (cossack posts, sentry squads) while important posts at a considerable distance must be more strongly held (pickets).

16–67. A picket is a group consisting of two or more squads, ordinarily not exceeding a platoon, posted in the line of outguards to cover a given sector. It furnishes patrols and one or more sentinels, double sentinels, sentry squads, or cossack posts for observation.

Pickets are placed at the more important points in the line of outguards, such as road forks. The strength of each depends upon the number of small groups required properly to observe its sector.

16–68. A **sentry squad** is a squad posted in observation at an indicated point. It posts a double sentinel in observation, the remaining men resting near by and furnishing the reliefs of sentinels. In some cases it may be required to furnish a patrol.

16–69. A **cossack post** consists of four men. It is an observation group similar to a sentry squad, but employs a single sentinel.

16–70. At night it will sometimes be advisable to place some of the outguards or their sentinels in a position different from that which they occupy in the daytime. In such case the ground is carefully studied before dark and the change made at dusk. Where an outpost occupies a position for a considerable length of time in close proximity to the enemy, provision for a frequent change in the position of outguards must be made in order to avoid their capture by hostile raiding parties.

16–71. Sentinels are generally used singly in daytime, but at night double sentinels will be required in most cases. Sentinels furnished by cossack posts or sentry squads are kept near their groups, those furnished by pickets may be as far as 100 yards away.

Every sentinel should be able to communicate readily with the body to which he belongs.

16–72. Sentinel posts are numbered consecutively from right to left in each outguard. Sentry squads and cossack posts furnished by pickets are counted as sentinel posts.

16–73. The arc of observation for which each sentry is responsible is clearly defined by definite terrain lines or points.

16–74. Instead of using outguards along the entire front of observation, part of this front may be covered by **patrols** only. Patrols are used to cover such sections of the front as can be crossed by the enemy only with difficulty and over which he is not likely to attempt a crossing after dark. They may also be used to supplement and extend the observation of sentries at night.

In daylight much of the local patrolling may be dispensed with if the country can be seen from the posts of the sentinels. Patrols should, however, frequently be pushed well to the front unless the ground in that direction is exceptionally open.

16–75. Patrols or sentinels must be the first troops which the enemy meets, and each echelon in rear must have time to prepare for the blow. These echelons cause as much delay as possible without sacrificing themselves and gradually retire to the line where the outpost is to make its resistance.

16–76. Patrols must be used to keep up connection between the parts of the outpost except when, during daylight certain fractions or groups are mutually visible. After dark this connection must be maintained throughout the outpost except where the larger subdivisions are provided with wire communication. Wire communication should extend as far forward as the supports.

16–77. In addition to the ordinary outguards, the outpost commander may detail from the reserve one or more **detached posts** to cover roads or areas or occupy important observation points not in the general line assigned to the supports.

In like manner the commander of the whole force may order detached posts to be sent from the main body to cover important roads or localities not included in the outpost line.

The number and strength of detached posts are reduced to the absolute needs of the situation.

Prominent points within the outpost position in rear of the outguards which afford views over the foreground are occupied as observation posts.

16–78. When combat is imminent, the necessity for unity of command will usually require the establishment of separate outposts or outguards by the smaller units (regiments, battalions, or companies) in the first line. Higher commanders insure contact and cooperation between adjacent units.

When battle is interrupted by nightfall and troops bivouac on the battlefield, each first-line company insures its own security by posting outguards and sending out patrols.

Orders for Sentinels on Outpost

16–79. The following instructions for sentinels on outpost correspond to the "General orders" of interior guards. They are of the greatest importance and all detachments on outpost duty must be thoroughly familiar with them:

1. **About myself and friendly neighbors.**

"My post is number ———, outguard number ———. The outguard is *there*. The post on my right is number ———, outguard number ———, and is *there*. The post on my left is number ———, outguard number ———, and is *there*. The support is *there*. Other detachments are *there* and *there*. *Such* and *such* patrols are operating in my front. This road leads to ———."

2. **About the enemy.**

"The enemy is reported to be *there*. I have seen him (describing exactly what hostile bodies I have seen) *there*; or, I have not seen him. I am to watch for him between *there* and *there*. If I see any unusual movement I am to report it at once to my outguard commander, who is *there*. If suddenly attacked and forced to retire or threatened with capture, I shall rejoin my outguard by going around *that way* so as not to disclose the position of my outguard to the enemy or to mask its fire."

3. **How to conduct myself on my post.**

"By day I shall make the best use possible of such natural or artificial cover as is available, standing, crouching, or lying down, and remaining stationary or moving about as will enable me to observe the sector assigned me to watch in the most efficient manner. I shall carry my piece at will, loaded and locked. I shall inform passing friendly patrols of what I have seen.

"At night I shall remain standing, habitually stationary, moving about only for the purpose of observation. I shall not sit or lie down unless authorized to do so."

4. **When to fire on the enemy.**

"Unless specially ordered to fire on the enemy whenever seen, I shall fire only under the following circumstances:

"(*a*) When suddenly attacked and there is no time to call the outguard commander, I shall fire rapidly but with careful aim.

"(*b*) When a person approaching my post is ordered to halt and fails to do so, or otherwise disobeys me, I shall fire deliberately, taking careful aim, so as to be sure to stop him."

5. **Treatment of individuals approaching my post.**

"By day I shall allow only officers, petty officers, and detachments recognized as part of the outpost, and officers known to have authority to do so, to pass my post either in or out. I shall detain all others and notify my outguard commander.

"At night when any persons approach my post, I shall come to a ready, halt them, and notify the outguard commander. Persons claiming to be deserters from the enemy are required to lay down their arms. If they are pursued by the enemy, I shall order them to drop their arms and I shall give the alarm. If they fail to obey me at once, I shall fire on them. I shall halt bearers of flags of truce and their escorts, require them to face outward, and at once notify the commander of the outguard."

Establishing and Relieving the Outpost

16–80. **Establishing the outpost.**—The outpost is posted as quickly as possible, so that the troops can the sooner obtain rest. Until the leading outpost troops are able to assume their duties, temporary protection, known as the **march outpost**, is furnished by the nearest available troops.

16–81. The halt order of the commander, besides giving the necessary information and assigning camp sites to the parts of the command, details the troops to constitute the outpost, assigns a commander therefor, designates the general line to be occupied, and, when practicable, points out the position to be held in case of attack.

16–82. The outpost commander, upon receipt of this order, issues the outpost order with the least practicable delay; it is of the first importance that the most essential measures be rapidly executed (e. g., occupation of important road connections). In large commands, it may often be necessary to give the order from the map, but usually the outpost commander will have to make some preliminary reconnaissance, unless he has an accurate and detailed map.

The order gives such available information of the situation as is necessary to the complete and proper guidance of subordinates, designates the troops to con-

stitute the supports, assigns their location and the sector each is to cover, provides for the necessary detached posts, indicates any special reconnaissance that is to be made, orders the location and disposition of the reserve, and informs subordinates where information will be sent.

16–83. Generally it is preferable for the outpost commander to give verbal orders to his support commanders from some locality which overlooks the terrain. The time and locality should be so selected that the support commanders may join their commands and conduct them to their positions without causing unnecessary delay to their troops. The reserve commander should, if possible, receive his orders at the same time as the support commanders. Subordinates to whom he gives orders separately should be informed of the location of other parts of the outpost.

In large outposts written orders are frequently most convenient.

After issuing the initial orders, the outpost commander inspects the outpost, completes his dispositions by more detailed orders, and sends his superior a report of his dispositions. He prescribes the degree of readiness for action and the conduct to be observed in case of attack.

He takes post where messages can most easily reach him and from which his orders can best be transmitted. His post must always be easy to find, especially at night. He must have at hand the necessary runners, cyclists, and mounted orderlies.

16–84. The reserve is marched to its post by its commander, who then sends out such detachments as have been ordered and places the rest in camp or bivouac, over which at least one sentinel should be posted. Connection must be maintained with the main body, the supports, and near-by detached posts. The place of formation in case of alarm must be clearly designated and understood by all members of the reserve.

16–85. The supports march to their posts, using the necessary covering detachments when in advance of the march outpost. A support commander marches with the advanced elements of his support, reconnoiters the ground, and prepares to issue his order. The order fully explains the situation to subordinates, or to the entire command if it be small. It details the troops for the different outguards or designates the units to furnish the outguards, and when necessary defines the sector each is to cover and the patrolling to be carried out. It provides the necessary sentinels at the post of the support, the patrols to be sent therefrom, and arranges for the necessary intrenching, construction of barricades, etc. Connection is maintained with adjoining supports and with the outguards furnished by the support.

16–86. In posting his command, a support commander seeks to cover his sector in such manner that the enemy can not reach the position of this support in dangerous numbers and unobserved, or pass by it within the sector intrusted to it. On the other hand, he must economize men on observation and patrol duty, for these duties are usually fatiguing. He must practice the greatest economy of men consistent with the requirements of practical security.

16–87. As soon as the posting of the support is completed, its commander inspects the disposition and corrects defects, if any, and reports the disposition of his support, including the patrolling ordered, to the outpost commander. This report is preferably made by means of a sketch. Dispositions are also communicated to adjacent supports.

16–88. Each outguard is marched by its commander to its assigned station and, especially in the case of a picket, is covered by the necessary patrolling to prevent surprise.

Having reached the position, the commander explains the situation to his men and establishes reliefs for each sentinel and if possible, for each patrol to be furnished. Besides these sentinels and patrols, a picket must have a sentinel at its post.

The commander then posts the sentinels and points out to them the principal features, such as towns, roads, and streams, and gives their names. He gives the direction and location of the enemy, if known, and of adjoining parts of the outposts.

He gives to patrols the same information and the necessary orders as to their routes and the frequency with which the same shall be covered. Each patrol should, when practicable, go over its route once before dark.

The reliefs pertaining to each sentry post accompany the first relief at the original establishment of the post. The outguard commander prescribes whether they are to return to the post of the outguard or remain near the sentry on post as a sentry squad or cossack post.

16–89. Every picket maintains connection by patrols with outguard on its right and left. Each commander takes precautions to conceal his outguard and generally strengthens his position by intrenching.

16–90. Relieving the outpost.—Evening and shortly before dawn are hours of special danger. The enemy may attack late in the day in order to establish himself on captured ground by intrenching during the night; or he may send forward troops under cover of darkness in order to make a strong attack at early dawn. Special precaution is therefore taken at those hours by holding the outpost in readiness and by sending patrols in advance of the line of observation. If a new outpost is to be established in the morning, it should arrive at the outpost position at daybreak, thus doubling the outpost strength at that hour.

16–91. Examining post.—An examining post is a small detachment under the command of an officer or a p. o., stationed at some convenient point to examine strangers and to receive bearers of flags of truce brought in by the outguards or patrols.

Though the employment of examining posts is not general in field operations, there are many occasions when their use is important; for example, when the outguards do not speak the language of the country or of the enemy; when preparations are being made for a movement and strict scrutiny at the outguards is ordered; at sieges, whether in attack or defense. When such posts are used, strangers approaching the line of observation are passed along the line to an examining post.

No one except the commander is allowed to speak to persons brought to an examining post. Prisoners and deserters are at once sent under guard to the rear.

Chapter 17

SECURITY IN POSITION WARFARE AND MARCHES

For more detailed instructions in the proper placing of outposts, patrols, and guards, see Army Combat Principles in Part III; TR 420-105, Rifle Squad, Section II; TR 420-110, Rifle Section, Sections V and VI; TR 420-115, Rifle Platoon, Sections V, VI, and VII; TR 420-120, Rifle Company, pars. 16, 20, and 28.]

Section I.—SECURITY IN POSITION WARFARE

General

17-1. In case the position held by the front-line troops is not favorable for defensive combat or when for other reasons it is inadvisable to offer the main resistance to a serious hostile attack in an advance position, a defensive position is selected further to the rear and the ground in front lightly held by an outpost. This arrangement is especially necessary when the end of an engagement leaves our troops in a disadvantageous position for fighting a defensive engagement.

When an outpost zone is not held, the line of resistance is, as a general rule, preceded by a line of observation held by outguards detailed by first-line companies.

The general principles of security set forth in preceding paragraphs of these regulations are applicable to position warfare. More detailed prescriptions which are the consequence of the stationary character of position warfare are treated in succeeding paragraphs.

17-2. Position warfare permits of the development of a highly organized service of security and observation and requires in part the training of a specialized personnel. The organization of this service comprises: (1) guard service of the position; (2) observation posts; (3) night patrols in front of the accessory defences; (4) sniper's posts.

Guard Service

17-3. The first-line platoons are the principal organs of the guard service of the position. They furnish the sentry posts for the line of observations and the advanced posts.

Units in rearward echelons establish such sentries as are necessary to insure their own readiness for action and for giving the alarm in case of gas attack. At least one sentry for each shelter is posted.

17-4. One officer in each company and one petty officer in each platoon is constantly on duty. They are responsible to their respective commanders for the service of security of their units. They make frequent inspections to assure themselves of the vigilance of the sentries and observers and their proper instruction and ascertain whether they have any information about the enemy to report.

17-5. The duties of the petty officer on guard are:

To familiarize himself with the location and exact duties of each combat group of the platoon;

To insure that sentries are alert, rifles loaded, gas-alarm apparatus in readiness;

To verify the condition of loopholes;

To verify the orders, written or verbal, which sentries transmit to each other;

To make known to sentries the time of departure and return of patrols and their itinerary;

To keep the flare pistol and fire it if suspicious noises are heard;

To report to the officer on watch and the platoon leader all incidents of his tour and the arrival of a superior officer;

To transmit to his successor the written or verbal orders and the panoramic sketch of the portion of the hostile position under observation.

17-6. Sentries may be posted directly from the first-line platoons by the petty officer on guard or from a sentry squad or cossack post.

17-7. Each sentry must be informed as to location of the post of his platoon leader and that of the sentry on each side and as to whether there are any patrols or working parties in front. Should there be any salients in our line, the sentry

is instructed so as to avoid any possibility of his firing toward our trenches. All sentries are instructed as to the method of giving the gas alarm. At night sentries are posted at the entrance to all shelters to arouse the occupants in case of attack or gas alarm. They are similarly posted during hostile bombardment to give warning when the enemy debouches for attack.

Sentries make as little noise as possible in challenging and advancing parties.

17–8. During the day, sentries observe through loopholes or by means of a periscope; at night, they observe over the parapet.

17–9. Listening posts are advanced sentry posts (usually cossack posts) established at night to warn the front-line garrison of the approach of hostile raiding or attacking parties.

When the listening post is connected with the front-line trench by a communicating trench, arrangements must be made for blocking or barricading the latter by the sentinel who falls back after giving the alarm.

17–10. As advanced posts are easy prey for hostile raiding parties, their habitual use should be avoided and should be resorted to only when it has been impossible to precede the line of resistance by an observation parallel or for certain specific purposes, such as observation of the accessory defenses when these are very wide, flanking the front of the trenches, etc.

17–11. Sentries are relieved every two hours except under unusual conditions. The number of sentries varies with the proximity of the enemy's trenches, the character of the enemy, the nature of our own defenses, the field of view to the front, and the distribution of our own troops. A larger number of sentries is required at night than during the day.

17–12. The primary function of sentries is to insure the immediate readiness of the command in case of hostile attack and to offer the first resistance to the enemy's advance. The continuous surveillance of the hostile position for the purpose of collecting information relative to the enemy is carried out by the observation posts.

Both sentries and observers serve as lookouts.

Observation

17–13. The functions of observation posts are:

(*a*) To gather information relative to the enemy; his daily life, habits, emplacements of his guns, movements carried out near the front, etc.;

(*b*) To give the alarm in case of attack.

17–14. Each unit (platoon, company, battalion, etc.) furnishes the personnel for its own observation posts.

17–15. The posts of commanders should be established near their observation posts. The choice of the latter precedes that of the former. In each unit, a sufficient number of posts should, when practicable, be established to insure that the entire sector of the unit is under continuous observation.

17–16. The essentials of a good observation post are good field of view, concealment, and sufficient space for two men. The design of the post should permit of construction in a single night and the post should be rain proof and splinter proof. The equipment of the post will vary with its importance and the field of view. The more important posts should be equipped with a telescope, an alidade, map, panoramic sketch, luminous compass, protractor, luminous watch, notebook, and pencil.

17–17. Except in the first-line companies, observation posts should, when practicable, be located at some distance from the trenches so that they will not be included in the fire directed against them. Placing the observation posts near prominent points of the terrain should be avoided. Men should be prohibited from walking about in the vicinity of observation posts. The posts and the passages leading to them should be carefully concealed and camouflaged. The formation of paths converging at a post should be particularly avoided.

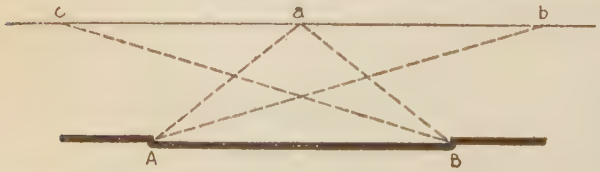

FIG. 225.—*a b* Part of enemy's trench observed by lookout A. *a c* Part lookout B of enemy's trench observed by

For better protection and concealment, observation posts should when practicable be oblique to the front (fig. 225).

17–18. Some men are naturally better qualified as observers than others; ability is developed by practice. The training of good observers is a matter of the greatest importance. They must not only be able to see without being seen, but they must have tenacity and patience to observe. The responsibility for their training rests on the company, battalion, or regimental officers under whose daily control the observers serve.

17–19. Each platoon should have at its disposal at least 6 observers of keen vision who are good shots. They alternate on duty in order to insure continuity of observation and are excused from certain other duties.

17–20. Observers thoroughly familiarize themselves with their sectors of observation by a detailed study of the terrain, of the panorama of the observation post, of maps of the sector, and of photographs. They are instructed in the use of the matériel of the observation post.

17–21. The observer should be particularly on the lookout in respect to:

Enemy sentries, snipers, working parties, and any points where he indicates his presence by periscopes, etc.;

Enemy trenches: saps, lookout posts, loopholes, breaches in trench, signs of reliefs, occupied sections, dugouts, new work, latrines, depots;

Wire: Gaps, new wire, tracks of patrols through wire;

Mining: Signs of soil excavated and materials carried;

Gas and liquid fire: Indications, such as the escape of gas after shelling, suspicious emplacements;

Batteries: activity, nature of guns, shells, and direction;

Lights: signals, rockets, flares, and searchlights;

Weather: wind (direction and force); visibility;

Airplanes and balloons.

The least change in the enemy lines (obstacles, ground dug up), or any other indication of preparation for an attack should be reported to the watch officer or p. o. Observers watch particularly the points to which their attention has been drawn by preceding observers and upon which they may hope to fire with success.

Patient, attentive observation always gives valuable information about the enemy's customs (time for reliefs, supplies, etc.).

Dust blown up by a shot, or smoke from a cigarette, may reveal a loophole habitually occupied. Earth thrown up indicates that a fatigue party is constructing a dugout or field work. A small earth heap and smoke reveal the location of a dugout. Study of the battle map and of aerial photographs may show the location of crossroads and the most important communication trenches upon which it is always advisable to fire with trench mortar at hours when they are supposed to be occupied.

Every effort should be made to locate machine guns, trench mortars, observation posts, etc., and to interpret the presence of the smallest object or any unusual sign appearing on the enemy's side. This information is indispensable in case we attack, and also to insure the daily wearing down of the enemy.

17–22. The observers combine their special work with giving the alarm by the means at hand in case of surprise attack or an attack preceded by a bombardment; giving the gas alarm; observing and repeating the prearranged signals. Observation posts must possess sure and rapid means of transmitting information to the units to be warned. Facility of communication should be considered in locating the post.

17–23. Observers in rearward echelons repeat signals and rockets from the first line.

Night Patrols

17–24. Observation is supplemented during the night by the reconnaissance of patrols detailed by the c. c. or the bn. c.

The missions of night patrols may be:

To gain information relative to enemy troops or enemy defensive works; to capture prisoners; to kill or harass the enemy.

These patrols always have a definite mission: To reconnoiter such point; to prepare an ambush at such place, etc. For the general mission of protection of the front line, stationary listening posts are more effective than patrols.

17–25. The officer sending out the patrol determines the time and point at which it will leave the lines (through hidden passages prepared in the barbed wire or from a listening post), the route, and the probable time and place of return. This information is communicated to watch officers and p. os., neighboring companies, and artillery, trench-mortar, and machine-gun units covering the sector.

17–26. Night patrolling should be systematically organized. For troops just commencing the occupation of a stabilized sector, the reconnaissances to be carried out should embrace:

(*a*) Our own front line and accessory defenses in front of it.

(*b*) Shell craters and old trenches between our front line and the hostile front line.

(*c*) Enemy wire, saps, listening posts.

These reconnaissances should as a rule be carried out in the order stated.

17–27. Reconnaissance of our own wire is first carried out for the purpose of ascertaining its condition and in order to locate gaps for the purposes of exit and entry. Landmarks on our own parapet are also located for purposes of subsequent orientation when operating in "no man's land." By taking bearings on the landmarks, patrols will be able to determine their own position at any time and render accurate report as to the location of objects reconnoitered.

17–28. Shell craters and old trenches are next reconnoitered to determine whether they are occupied by the enemy, and if so, the strength of the post, the state of wire protection, practicability of raiding the post, etc.

17–29. In investigating the enemy's wire, it is generally best to work from one or both flanks inward. The starting point is located by taking a bearing from some point within our own lines or from a sap head. The stopping point should similarly be located by bearings on prominent objects in our own back area or within the enemy's lines. When reporting on wire, the following points should be observed:

1. Strength, height, depth, thickness or density, number of lines of wire.
2. Distance of inner line from enemy front line, distance between lines, map location of portion examined.
3. Gaps: Map location, width, whether straight or zigzag, whether left purposely for passage of enemy patrols or cut by our gunfire.
4. Effect of our recent gun or trench-mortar fire.
5. Nature of construction: Apron wire, chevaux-de-frise, barbed, whether wooden or metal screw stakes are used, etc.
6. New work: position and extent and probable date of construction.

Whenever investigating a gap for a raid, it is imperative that the patrol leader go completely through it in order to be certain that no obstacle to the passage exists.

17–30. Patrols sent out to gain information should not fight unless it is necessary to do so to accomplish their mission.

These patrols should be small in numbers (2 to 5 men).

Patrols sent out for capture of prisoners should be stronger than reconnoitering patrols (5 to 15 men).

17–31. Before departure, patrols should have studied the ground to be covered from maps, airplane photographs, and observation posts. In case the mission is the capture of prisoners, they should be familiar with the habits of the enemy, the routes followed by his patrols, the location of his sentries, listening posts, advanced posts, etc. The best means of capturing a hostile patrol is the preparation of an ambush along its route; stalking hostile patrols should in principle be avoided.

Patrols for the protection of working parties should select a good covering position and avoid unnecessary movement.

17–32. Before departure, the patrol leader examines the equipment of the patrol to see that it makes no noise. Patrols should never wear steel helmets as they click when they hit a piece of barbed wire, show an unmistakable outline, and prevent crawling with the face on the ground. Revolvers and grenades are usually the only arms carried. Rifles are too unwieldly and noisy and soon become unserviceable due to clogging with mud. Hands and face and the outside of revolvers should be stained with mud. Men subject to cough should carry gum as a preventative; a cough close to the enemy is certain means of detection. All forms of identification such as identity disks, insignia, and letters should be removed. Luminous watches and compasses should be covered. All men of the patrol should know the time and place of departure, the route to be followed, the time and place of return, and the signals for communication with each other.

17–33. For the purposes of better observation by the patrol, flares may be sent up from our front-line trench at prearranged times. When the time comes for the flare to be fired, the entire patrol must be in shell holes or under cover. Care must be taken that the flare is so fired as to pass over the heads of the patrol. A flare falling behind the patrol will throw it into relief and expose it to hostile view. A light dropping just in front of the hostile front line blinds the enemy

and shows up the wire very plainly to the patrol. If the light goes beyond the hostile trench, it does not blind the enemy but still shows up the wire very plainly to the patrol. The best time to observe is while the light is still in the air and before it has passed over the hostile front line. While the patrol is out, no other flares must be fired near the place where it is working.

A patrol should remain motionless the moment a flare goes up. The best time to move is when it has just gone out.

17–34. The formation of the patrol will vary according to circumstances. Generally, some form of wedge formation which permits the patrol to form rapidly for action in any direction is most effective. Unless the night is very bright or many flares are being sent up, the patrol may advance by crouching or creeping to within 100 yards of the hostile line. Beyond this point, movement must be by crawling, using increasing care to within 15 or 20 yards of the enemy line, where movement is possible only by inches. During this latter stage of the advance, members of the patrol must be in constant physical touch with each other. One man must be constantly listening while the others are advancing. The route of advance selected should be in dead ground as far as possible. Care must be taken to avoid sky lines and get off the lips of shell craters as soon as possible.

The following method of crawling should be practiced:

Lie flat on the belly on the ground, heels down, left side of face on ground; extend arms forward overhead, being careful not to raise the head. Feel the ground in front and then bring back the hands to the side of the head. Pull up right leg and push the body forward, raising very slightly on the elbows. For faster traveling when farther away from the enemy, alternate movement on right and left side. Keep the heels down.

17–35. The return journey of the patrol should be made by a different route from that followed in its advance.

17–36. Patrol duty is an excellent means of elevating a man's courage. Volunteers should be called for in exceptional cases only.

Sniping

17–37. The purpose of observation in the trenches is not only to give warning when the enemy leaves his trenches but continuously to watch for every detail which may take place within his defensive organization and take advantage of his slightest movement for inflicting losses upon him.

Fire for the purpose of wearing him down should be the constant object of all platoon leaders and troops and should not be slackened for fear of reprisals.

17–38. In the execution of harassing fire, observers and snipers frequently work in pairs, the observer indicating the targets discovered to the sniper and observing the results of his fire.

17–39. Sniping fire may be delivered from specially constructed sniping posts, from shell craters, sapheads, or other position outside the trenches, through loopholes in the parapet or over the parapet. The rifle may be laid in a fixed rest or on a sniperscope mounting or fired without special rest, using a telescopic sight or ordinary rifle sights modified to increase their visibility for night firing.

17–40. Sniping posts are so located and sectors of fire so assigned to each post as to cover the entire front. The posts must be located within 400 yards from the hostile front line. They may be in the first, second, or third trench, in approach trenches, in our own wire, in shell holes in front of our front line, or between our lines or in trees or houses. For each post, at least one alternative position should be selected.

Concealment is the most important element in the construction of snipers' posts. Background must be given careful consideration. The post may be concealed by the adaptation of various objects, such as an old boot with a loophole cut in the heel, spool of barbed wire, dummy sandbag, artificial tree stump, etc.

The design of snipers' posts must embody the following requisites:

The post must be capable of construction in one night;

It must afford sufficient space for two men;

It must be rain proof;

It must provide room for head and shoulders;

It must provide a rest for rifle and arm;

Loopholes must be pointed in the proper direction; the proper alignment may be insured by driving stakes on the line of fire;

A cover for the loophole must be provided;

There must be a curtain or other means of darkening the entrance.

17–41. The following precautions should be observed in the use of sniping posts:

The loophole should be masked when the curtain is drawn;

Smoking must not be permitted in the post;

Glittering objects should be kept out of sight;

The rifle should not be allowed to project too far beyond the loophole;

Care must be taken that shots do not kick up dust in front of the loophole and betray the location of the post.

If the post is discovered, it should be temporarily discontinued or completely abandoned, and a new location selected.

Sniping posts should be provided with a landscape sketch and a range card.

For night firing, provision must be made for blinding the flash of discharge by placing a double thickness of canvas or sandbag 18 or 20 inches in front of the muzzle. The screen should be removed before dawn.

17–42. The rifle may be laid by day on the objectives selected for night firing and clamped on its line of fire.

Favorable objectives are: Gaps in enemy's wire which will probably be repaired at night; sap heads; sentry and lookout posts; loopholes; dugouts; exposed points in approach trenches; machine guns spotted by their flashes.

17–43. Sniping fire may be employed in conjunction with the operations of patrols to distract the attention of the sentry at the point to be reconnoitered.

17–44. Targets are usually most numerous in the early morning or at dusk, and snipers should be particularly alert at these times. The sniper is at a disadvantage when he is facing the sun. He should if possible select the time for firing when the light is full on the ground where targets are expected and he himself is in a comparatively bad light. Additional protection from discovery may be secured by the use of camouflage clothing and by disguises improvised by using grass, leaves, etc., and by smearing hands, face, and equipment to harmonize with surroundings. Regular outline of any shape and abrupt movements must be avoided.

17–45. Provision should be made for firing on transient objectives which reveal themselves at night. For this purpose, a visible line of sight must be improvised or telescopic sights employed. A line of sight may be improvised by attaching a piece of white cotton to the front sight and a strip of white tape along the barrel from front to rear sight and by pasting a piece of white cardboard with a hole punched in center on the rear sight. An effective range from 30 to 50 yards may be obtained in this manner. When a bright moon, effective fire at a range of 200 yards can be delivered with the telescopic sight.

17–46. Snipers must be skilled in working the bolt of the rifle and in loading noiselessly. To avoid long flashes, the barrel and bolt must be absolutely dry. The sniper should remain in shadow, occupy low ground, and try to get the enemy on the sky line. To draw targets or locate hostile snipers, some sort of decoy may be successfully employed. Effort should be made to locate the direction from which hostile sniping comes. Any casualty from rifle fire should be at once reported and investigated, and snipers especially detailed to deal with hostile snipers responsible.

17–47. Rifle grenades are also used for the delivery of harassing fire. For night firing the rifle is registered by day on important objectives.

Coordination and Transmission of Information

17–48. Regulations relative to coordination and transmission of information obtained through observation are contained in Army Training Regulations: TR 160–5, Signal Communication for All Arms; TR 162–2, Visual Signaling; TR 165–5, Wire Axis Installation and Maintenance within the Division.

Tactical Conduct of Outposts

17–49. The conduct of an outpost is essentially a defensive operation. The provisions of these regulations relative to the defensive apply to the conduct of an outpost in case of hostile attack and to the preparation of plans of outpost defense.

Section II.—PATROLS

17–50. The following paragraphs on patrols relate in particular to the conduct of the patrol and its leader, and apply to patrols employed in covering detachments as well as in combat reconnaissance.

17–51. A patrol is a detachment, varying in strength from two men to a company, sent out from a command to gain information of the country or of

the enemy or his defenses, or to prevent the enemy from gaining information. In special cases patrols may be given missions other than these.

17–52. The commander must have clearly in mind the purpose for which the patrol is to be used in order that he may determine its proper strength, select its leader, and give the latter proper instructions.

17–53. The missions of patrols may be:

Before combat, to keep in touch with the enemy and observe his movements or to prevent the enemy from observing the movements of our own troops;

During combat, to keep in touch with units on the flanks and prevent the enemy from turning or attacking the flanks of our own forces;

After combat, to reconnoiter the enemy position or to seize tactical features in front of the line reached by the assaulting infantry, or to cover the consolidation of the line;

In general, to reconnoiter some portion of the enemy's forces or position, or some natural or artificial geographic feature, and obtain information relative thereto.

As a rule a patrol is sent out for one definite purpose only. Indefiniteness as to mission results in a hesitant and defensive attitude on the part of the patrol.

If the purpose is to gain information only, a small patrol is better than a large one. The former conceals itself more readily and moves less conspicuously. For observing from some point in plain view of the command or for visiting or reconnoitering between outguards, two men are sufficient.

If messages are to be sent back, the patrol must be strong enough to furnish the probable number of messengers without reducing the patrol to less than two men. If hostile patrols are likely to be met and must be driven off, or if the mission be the capture of prisoners, the patrol must be strong.

In friendly territory, a weaker patrol may be used than would be used for the corresponding purpose in hostile territory.

17–54. The character of the leader selected for the patrol depends upon the importance of the work in hand.

For patrolling between the groups or along the lines of an outpost, or for the simpler patrols sent out from a covering detachment, the average seaman will be a competent leader.

17–55. For a patrol sent out to gain information or for a distant patrol sent out from a covering detachment, the leader must be specially selected. He must be able to cover large areas with few men; he must be able to estimate the strength of hostile forces, to report intelligently as to their dispositions, to ead indications, and to judge as to the importance of the information gained. He must possess endurance, courage, and good judgment.

The officer sending out the patrol verifies the detail, designates a second in command, and gives the necessary instructions. His instructions are full and clear. The patrol leader is given such information of the enemy and country as may be of value to him. He is informed as to the general location of his forces, particularly of those with whom he may come in contact. He must be made to understand exactly what is required of him, where to go, when to return, and where messages are to be sent or the patrol is to report. If possible, he is given a map of the country he is to traverse, and in many cases his route may be specified. Sentries are notified as to the patrols operating in their front.

The officer sending out the patrol must be certain that his instructions are understood.

Besides his arms and ammunition the patrol leader is equipped with a luminous compass, a watch, a pencil, a notebook, a flash light, and when practicable, field message blanks and a map of the country.

The patrol leader assembles the men detailed for the patrol. He inspects their arms and ammunition and satisfies himself that they are in suitable condition for the duty. He sees that none has any papers, maps, etc., that would be of value to the enemy if captured. He sees that their accouterments do not glisten or rattle when they move. He then repeats his instructions to the patrol and assures himself that every man understands them. He explains the signals to be used and satisfies himself that they are understood.

17–56. No normal formation for the patrol is, or should be, prescribed. The information and the movements of the patrol must be regulated so as to render probable the escape of at least one man in case the patrol encounters a superior force. The formation will depend upon the nature of the ground traversed and the cover afforded. The leader must adopt the formation and measures best suited to the accomplishment of his object.

In general, it should have the formation of a main body with advance, rear, and flank guards, though each be represented only by a single man.

17–57. The distances separating the members of the patrol vary according to the ground and the proximity of the enemy. If too close together, they see no more than one man; if too widely separated they are likely to be lost to the control of the leader. When at close range from an enemy whose position has been located and at night the formation of the patrol is relatively close.

17–58. In general, a patrol advances from one intermediate point to another along its route of advance by bounds, successive positions being reconnoitered as far as practicable before leaving the preceding position. The country must be carefully observed as the patrol advances. In passing over a hill, the country beyond is first observed by one man; houses, inclosures, etc., are approached in a similar manner or avoided entirely; woods are generally reconnoitered in a thin skirmish line when the object is to determine whether they are occupied; in passing through woods on other missions, the patrol is kept together and protected by the necessary scouting.

17–59. In questioning civilians, caution is observed not to disclose any information that may be of value to the enemy. Strangers are not allowed to precede the patrol. Patrol leaders are authorized to seize telegrams and mail matter and to arrest individuals when necessary.

17–60. When a patrol is scattered, it reassembles at some point previously selected; if cut off, it returns by detour or forces its way through. As a last resort, it scatters so that at least one man may return with the information.

17–61. The strength and the composition of hostile troops must be observed. If they can not be counted, their strength may be estimated by the length of time a marching column consumes in passing a given point or by the area covered if in camp.

Infantry in column of squads may be assumed to occupy half a yard per man, cavalry in column of fours 1 yard per trooper, and artillery in single column 20 yards per gun or caisson. A given point is therefore passed in one minute by about 175 infantry; 110 cavalry at walk; 200 cavalry at trot; 5 guns or caissons. For troops in column of twos, this estimate is reduced by one half.

Patrol leaders should, if practicable, know the uniforms of the various enemy organizations in order that they may be able to determine the class of troops seen when no other indications are available.

Insignia from the enemy's uniforms, picked up by patrols, often convey valuable information by indicating what troops are in the vicinity.

17–62. Patrols avoid fighting, except in self-defense or in order to prevent the enemy's patrols from gaining valuable information, or when necessary in order to accomplish their mission. In such cases a patrol fights resolutely even though inferior in numbers.

17–63. Information gained by patrols is generally of no value unless received in time to be of use to the commander. Patrol leaders must therefore send back information of importance as soon as it is gained, unless the patrol itself is to return at once.

17–64. If written, messages state the place, date, hour, and minute of their dispatch. The information contained in them is clearly and concisely expressed. They are signed by the patrol leader.

The authorized message book is used, and the form therein adhered to. In pertinent cases, messages are accompanied by a sketch. Where a map reference is necessary, the name of the map is stated. The source of all information is given. Negative information may be of value.

17–65. If the message be verbal the patrol leader requires the messenger to repeat it before starting back. In general, a verbal message covers but one point. Except when there is little chance of error in transmission, messages are written. The messenger must clearly understand where the message is to be delivered and the route to be followed. Verbal messages are subsequently confirmed in writing when practicable.

17–66. When in friendly territory and not very far from friendly troops, one messenger is sufficient unless the message is very important. In hostile territory, either two men go together, or the message is sent in duplicate by different routes.

17–67. Whether the information gained is of sufficient importance to be reported at once or may await the return of the patrol is a question which must be decided in each case. In case of reasonable doubt it is generally better to send the report promptly. If the patrol leader has received proper instructions before starting out and has the requisite ability to lead a patrol, he can generally decide such questions satisfactorily as they arise.

17–68. Infantry patrols are generally used for work within 2 miles of supporting troops, but cases arise where they must go to greater distances.

For distant patrolling, a mounted patrol under an officer is detailed.

17–69. For controlling the movements of the patrol, the leader makes use of the arm signals prescribed in these regulations when practicable.

On account of the short distances separating them, members of the patrol ordinarily communicate with each other quietly by word of mouth.

When a member of a patrol is sent to a distant point, communication may be effected by means of simple, prearranged signals. In addition to the signals prescribed in chapter 8, the following signals should be clearly understood by members of a patrol:

Enemy in sight in small numbers: Hold rifle above head horizontally.

Enemy in force: Same as preceding, raising and lowering the rifle several times.

For communicating with the units from which they are sent out, it will often be advantageous to equip patrols with signal projectors.

Mounted Scouts

17–70. Mounted scouts should be thoroughly trained in patrolling and reconnaissance. They are used for communication with neighboring troops, for patrolling off the route of march, for march outposts, outpost patrols, combat patrols, reconnaissance ahead of columns, etc. Their further use is, in general, confined to escort and messenger duty. They should be freely used for these purposes, but for these purposes only.

17–71. When infantry is acting alone, or when the cavalry of a mixed command has been sent to a distance, mounted scouts are of special importance to covering detachments and should be used to make the reconnaissance which would otherwise fall to cavalry.

17–72. In reconnaissance, scouts should be used in preference to other troops as much as possible. When not needed for mounted duty, they should be employed for necessary dismounted patrolling.

17–73. Battalion staff officers should be specially trained in patrolling and reconnaissance work in order that they may be available when a mounted officer's patrol is required.

Section III.—MARCH PROTECTION

General Considerations

17–74. A column on the march in the vicinity of the enemy is covered by detachments called advance guards, rear guards, or flank guards. The object of these covering detachments is to facilitate the march of the main body and to protect it from surprise or observation.

They facilitate the march of the main body by promptly driving off small bodies of the enemy who seek to harass or delay it, by removing obstacles from the line of march, by repairing roads, bridges etc., thus enabling the main body to progress uninterruptedly in convenient marching formation.

They protect the main body by preventing the enemy from firing into it when in close formation, by holding the enemy and enabling the main body to deploy before coming under the effective fire, by preventing its size and condition from being observed by the enemy, and in retreat, by gaining time for it to make its escape or to reorganize its forces.

When the enemy is encountered on the defensive, to seize a good position and locate his lines, care being taken not to bring on a general engagement unless the advance guard commander is empowered to do so.

17–75. Tactical unity is respected in making details for covering detachments.

17–76. The march order of the whole command explains the situation, details the commander and troops for each covering detachment, specifies the route to be taken and the approximate distance to be maintained between the main body and its covering detachments, and directs such reconnaissance as the commander specially desires to have made. When practicable, the front to be covered by reconnaissance is specified.

The order of the commander of a covering detachment clearly explains the situation to subordinates, assigns the troops to the subdivisions, prescribes their approximate distances, and orders such special reconnaissance as may be deemed immediately necessary.

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An advance or flank guard commander marches well to the front, and from time to time orders such additional reconnaissance or makes such changes in his dispositions as the circumstances of the case demand.

Advance Guard of a Large Command

17–77. **Strength and composition.**—Subject to variation according to the situation, one-twentieth to one-third of a command may be assumed as a suitable strength for the advance guard. The larger the force the larger in proportion is the advance guard, for a large command takes relatively longer to prepare for action than a small one. In large commands it is usually composed of all arms, the proportions depending on the nature of the work, character of the country, etc. In open country it should be strong in field artillery, but artillery is seldom assigned to the advance guard of a command not larger than a brigade. In such cases, however, when there is artillery with a command, an officer of that arm usually accompanies the advance guard for purposes of artillery reconnaissance. In swampy country or jungle it may be formed of infantry alone.

Machine guns materially increase the effectiveness of an advance guard. They are useful in holding bridges, defiles, etc., until reenforcements can be brought up.

Pioneers are usually attached to an advance guard to remove obstacles, repair roads, etc.

The supreme commander generally retains control of the signalmen, and establishes such lines of information as he deems necessary. However, when the nature of the country favors communication by signaling, signalmen may be attached to the advance guard.

An ambulance party usually accompanies large advance guards.

17–78. **Distance from main body.**—The distance at which the advance guard precedes the main body, or the main body follows the advance guard, is stated in the march order. In small commands, where there is no difficulty in keeping touch with the main body, the march order generally requires the advance guard to regulate its march on the main body; but where the advance guard is large, or moves at a considerable distance in advance of the main body, the latter regulates its march on the advance guard.

While the distance between these two bodies should be great enough to prevent needless interruptions in the march of the main body, and to give the latter time to deploy should the enemy be encountered, it should never be so great that timely support of the advance guard becomes impracticable.

17–79. **Advance guard commander.**—The advance guard commander is responsible for its formation and conduct. Its own security must be effected by proper dispositions and reconnaissance, not by timid or cautious advance. It must advance at normal gait and search aggressively for information of the enemy. Its action when the enemy attempts to block it with a large force depends upon the situation and plans of the commander of the troops.

On receipt of the march order the advance guard commander estimates the situation and, at the proper time, issues the advance guard order. This order divides the advance guard into its tactical components (advance party, support, etc), and gives the necessary instructions for each.

The advance guard commander is mounted, if practicable, and goes wherever he deems his presence necessary, though his habitual station is at the head of the reserve, or with the support when there is no reserve. He conducts the advance so as not to interrupt the steady march of the main body, and, when ordered to move at a certain distance in front of the latter, maintains the necessary connection therewith. He bears constantly in mind the duties of an advance guard, and studies the ground with a view to tactical dispositions should the enemy be encountered.

17–80. **Distribution of troops.**—An advance guard order generally prescribes the following distribution of troops:

Advance party.
Support.
Reserve.

17–81. The formation of the advance guard must be such that the enemy will be met first by a patrol, then in turn by one or more larger detachments, each capable of holding the enemy until the next in rear has time to deploy before coming under effective fire.

17–82. **The advance party** constitutes the reconnoitering element of the support; it is made strong enough to furnish the patrols required for the reconnaissance of the front of the advance.

17-83. **Support.**—The support varies in strength from one-fourth to one-half of the advance guard. In mixed commands it consists of infantry, to which pioneers may be attached.

As the support moves out it sends forward an advance party several hundred yards, the distance varying with the terrain and the size of the command.

The advance party reconnoiters to the front and flanks to guard the support against surprise by effective rifle fire. The patrol preceding the advance party on the line of march is called the point, and is commanded by an officer or an experienced petty officer.

If there is no advance cavalry, the advance party is made stronger (about one-half of the support), and the flanks are guarded, if necessary, by additional patrols sent out from the support and even from the reserve.

The support commander ordinarily marches with the advance party, but goes wherever needed. He sees that the proper road is followed; that guides are left in towns and at crossroads; that necessary repairs are made to roads, bridges, etc.; and that information of the enemy or affecting the march is promptly transmitted to the advance guard commander. He endeavors promptly to verify information of the enemy.

The function of the support is in principle the security of the reserve, and the offering of such resistance at various points on the front of the advance as will enable the reserve to deploy for action at points of decisive importance. It is given sufficient strength to carry out its reconnoitering and resisting function.

17-84. **Reserve.**—The reserve constitutes the maneuvering and offensive element of the advance guard; it therefore comprises as large a proportion of the advance guard as is consistent with its own security and the preservation of its maneuvering power.

The reserve follows the support at several hundred yards distance. It consists of the remainder of the infantry and pioneers, the artillery, and the ambulance party. The artillery usually marches near the head of the reserve, the pioneers and special troops at the rear.

17-85. In an advance guard consisting of one battalion, the machine guns, if any, usually form part of the reserve. In an advance guard consisting of two or more battalions, machine guns are assigned to the support and the reserve. Light mortars, one-pounder guns, and accompanying artillery march with the reserve; the pioneer platoon is attached to the support.

17-86. Connection between the elements of an advance guard is maintained from rear to front, unless otherwise expressly ordered. When the distance between parts of the advance guard or the nature of the country is such as to make direct communication difficult, connecting files march between the subdivisions to keep up communication. Each element of the column sends the necessary connecting files to its front. Cyclists and mounted orderlies may often be advantageously employed for the maintenance of connection.

In supports of a strength equaling or exceeding three companies, a company usually constitutes the advance party. In small supports, it will frequently be advantageous to retain the entire support in one body and send out the point and other patrols directly from it.

17-87. The distances separating the parts of an advance guard vary according to the mission of the whole force, the size of the advance guard, the proximity and character of the enemy, the nature of the country, etc. They increase as the strength of the main body increases; they are less when operating in rolling, broken country than in open country; when in pursuit of a defeated enemy than against an aggressive foe; when operating against cavalry than when against infantry.

If there be a mounted point, the infantry maintains its gait without reference to it; the mounted point regulates its march on the infantry.

17-88. To afford protection to an infantry column, the country must be observed on each side of the road as far as the terrain affords positions for effective rifle fire upon the column. In addition to the reconnaissance of the advance party, it will frequently be necessary to send out detached patrols from the support and reserve. If the country that it is necessary to observe be open to view from the road, reconnaissance may not be necessary.

17-89. The advance guard is responsible for the necessary reconnaissance of the country on both sides of the line of march. Special reconnaissance may be directed by the commander of the troops, or cavalry may be reconnoitering at considerable distances to the front and flanks, but this does not relieve the advance guard from the duty of local reconnaissance.

17–90. Patrols are sent to the flanks when necessary to reconnoiter a specified locality and rejoin the column and their proper subdivision as soon as practicable.

Where the country is generally open to view, but localities in it might conceal an enemy of some size, reconnaissance is necessary. Where the road is exposed to fire and the view is restricted, a patrol is sent to examine the country in the direction from which the danger threatens. The object may be accomplished by sending patrols to observe from prominent points. When the ground permits and the necessity exists, patrols may be sent to march abreast of the column at distances which permit them to see important features not visible from the road.

Mounted men or cavalry, when available, are used for flank patrols.

17–91. Cases may arise where the best means of covering the head and flanks of the column will be by a line of skirmishers extending for several hundred yards to both sides of the road, and deployed at intervals of from 10 to 50 yards. A column may thus protect itself when passing through country covered with high corn or similar vegetation. In such case, the vegetation forms a natural protection from rifle beyond very short ranges.

17–92. Fixed rules for the strength, formation, or conduct of advance guards can not be given. Each case must be treated to meet conditions as they exist. That solution is generally the best which, with the fewest men and unbroken units, amply protects the column and facilitates the advance. When in close contact with the enemy and passing through the zone of his artillery fire, the larger fractions of the advance guard advance in approach formation.

17–93. Reconnaissance.—In conducting the reconnaissance the patrols are, as a rule, small—from two to six men. If additional protection is necessary, a flank guard covers the threatened flank. The flanking patrols of the advance party are sent out to examine the country wherever the enemy might be concealed. If the nature of the terrain permits, these patrols march across country or along roads and trails paralleling the march of the column. For infantry patrols and even with those that are mounted, reconnaissance is generally best done by sending the patrols to high places along the line of march to overlook the country and examine the danger points. These patrols report or signal the results of their observations and, unless they have other instructions, join their units by the most practicable routes, other patrols being sent out as the march proceeds and as the nature of the country requires.

Deserters, suspicious characters, and bearers of flags of truce, the latter blindfolded, are taken to the advance guard commander.

Civilians are not permitted to precede the advance guard.

Communications between the fractions of an advance guard and between the advance guard and main body are maintained by wire, messenger service, or signals.

Advance Guard of a Small Command

17–94. In forming the advance guard of a command smaller than a brigade, the foregoing distribution is modified, depending upon the situation. A company usually sends forward only a point; a battalion, an advance party; but a battalion at war strength should put a company in the advance guard and a regiment should put a battalion if an enemy is liable to be met. Whenever the advance guard is less than a battalion, there is no reserve.

17–95. In an advance guard consisting of two battalions or less, the reserve and support, if both are used, are approximately equal; in larger advance guards, the reserve is approximately two-thirds of the whole detachment.

In an advance guard consisting of one battalion, the machine guns, if any, form part of the reserve. In an advance guard consisting of two or more battalions, the machine guns form part of the support.

17–96. The **support** sends forward an **advance party.** The **advance party,** in turn, sends a patrol, called a **point,** still farther to the front. Patrols are sent out to the flanks when necessary. When the distance between parts of the advance guard or the nature of the country is such as to make direct communication difficult, connecting files march between the subdivisions to keep up communication. Each element of the column sends the necessary connecting files to its front.

17–97. A battalion acting as an advance guard should be formed about as follows: The **reserve,** two companies; the **support,** two companies; the **advance party,** three to eight squads (about a half company), depending upon the strength of the companies and the reconnaissance to be made; the **point,** a p. o. and three or four men. Or the reserve may be omitted. In such case the advance party

will consist of one company preceded by a strong point. The remaining companies form the support.

If there be a mounted point, it should precede the dismounted point by 250 to 600 yards. The advance party may be stronger when there is mounted point in front. The infantry maintains its gait without reference to the mounted point, the latter regulating its march on the former.

17–98.—To afford protection to an infantry column, the country must be observed on each side of the road as far as the terrain affords positions for effective rifle fire upon the column. If the country that it is necessary to observe be open to view from the road, reconnaissance is not necessary.

17–99. Cases may arise where the best means of covering the head and flanks of the column will be by a line of skirmishers extending for several hundred yards to both sides of the road, and deployed at intervals of from 10 to 50 yards. A column may thus protect itself when passing through country covered with high corn or similar vegetation. In such case, the vegetation forms a natural protection from rifle fire beyond very short ranges.

17–100. Fixed rules for the strength, formation, or conduct of advance guards can not be given. Each case must be treated to meet conditions as they exist. That solution is generally the best which, with the fewest men and unbroken units, amply protects the column and facilitates the advance.

Security for the Head of a Retreating Force

17–101. In retreat a column is preceded by a body of troops designated 'leading troops," whose principal duty is to clear the road of obstacles and facilitate the withdrawal of the command. The strength and composition of such troops are determined by the situation. Pioneers are generally necessary. If the rear is seriously threatened, the leading troops march practically as an advance guard.

Rear Guards

17–102. A rear guard is a detachment detailed to protect the main body from attack in rear. In a retreat, it checks pursuit and enables the main body to increase the distance between it and the enemy and to re-form if disorganized.

The general formation is that of an advance guard reversed.

17–103. The commander takes advantage of every favorable opportunity to delay the pursuers by obstructing the road or by taking up specially favorable positions from which to force the enemy to deploy. In this latter case, care must be taken not to become so closely engaged as to render withdrawal unnecessarily difficult. The position taken is selected with reference to ease of withdrawal and ability to bring the enemy under fire at long range.

17–104. Machine guns and infantry batteries and single guns form a very important part of the rear guard.

17–105. During a retreat the outpost for the night usually forms the rear guard of the following day.

17–106. **Strength and composition.**—The strength of a rear guard depends upon the nature of the country and the strength and character of the pursuing force. It can not, like the advance guard, count on the support of the main body.

Machine guns are especially useful in the passage of defiles and in covering the crossings of rivers.

Pioneers and ambulance parties may be assigned to rear guards.

The troops of a rear guard are selected from those that have had previous successes, or have suffered little loss and are comparatively fresh.

17–107. **Distribution of troops.**—The proximity and conduct of the enemy control, to a large extent, the formation of a rear guard. When it is not necessary to withdraw in deployed lines, the greater part of the rear guard marches on the road in column of route, taking up a formation resembling that of an advance guard faced to the rear. The distribution of troops is therefore similar to that of an advance guard, namely:

Reserve.
Support.

The support, as in an advance guard, is divided into two parts; that part nearest the enemy is called the rear party and marches with the rear point. Pioneers may accompany the support or be attached to the rear party. The reserve is composed mainly of infantry and artillery.

17–108. **Distances.**—The distances of the rear guard from the main body and between the fractions of the rear guard are about the same as in the case of an advance guard. If marching at night, the rear guard draws nearer the main body.

Rear Guard of an Advancing Force

17–109. If there is a possibility that the rear of the column may be attacked, a rear guard of suitable strength and composition is provided. Its conduct is practically the same as that of the rear guard of a retreating force. It generally marches in rear of the trains, those organizations following the combatant troops without distance.

Flank Guards

17–110. The flanks of a column are protected in part by the advance guard, which carefully examines the ground on both sides of the line of march. It may be necessary, however, to provide additional security for a flank threatened by the enemy. This is done by sending a detachment, called a flank guard, to cover the exposed flank.

17–111. **A flank guard** is a detachment detailed to cover the flank of a column marching past, or across the front of the enemy. It may be placed in position to protect the passage, or it may be so marched as to cover the passage.

17–112. The object of the flank guard is to hold the enemy in check long enough to enable the main body to pass, or like the advance guard, to enable the main body to deploy.

Like all other covering detachments, it is made no stronger than is necessary; it is detailed only when special flank protection is required.

17–113. Practicable communication must exist between the flank guard and the main body.

17–114. The flank guard is marched in the same manner as a separate command; that is, with advance or rear guards or both, as circumstances demand, and with patrolling on the exposed flank.

17–115. At times it may be necessary for an advance-guard commander to send out large reconnoitering parties which temporarily assume the character and duties of a flank guard. Such parties are given specific orders as to when and where they are to rejoin the column.

17–116. **Flank marches.**—When the main body, executes a flank march near the enemy, the flank guard becomes a body of great importance. If the flank march is due to a considerable change of direction in the march of the column, it is generally advisable to convert the advance guard into a flank guard, and detail a new advance guard to precede the column. If the troops making a flank march start from camp, a separate flank guard will have to be provided.

In long columns the large units, such as regiments, will provide their own flank observation.

Provost Guards

17–117. **A provost guard** is formed by the commanding officer where one is deemed necessary. It is commanded by a provost marshal, under whose orders the guard acts.

17–118. The duty of the provost guard is to enforce all police regulations adjacent to a camp or marching column. They protect the inhabitants of the country from pillage and violence and prevent excesses of all kinds; keep all roads clear; arrest all enlisted men and civilian employees absent without proper authority from their organizations; arrest all marauders, and collect all stragglers and hand them over to their organizations.

They keep a list and description of all camp retainers and followers and watch their conduct.

They police all railroad stations, public houses, depots, and public buildings, protect telegraph and telephone lines and railways from damage; keep hostile inhabitants in order, carry out their disarmament and prevent spying.

17–119. In cases of emergency the provost guard may call on any troops to assist them. All persons belonging to the military service are required to give every assistance to the provost guard in the execution of their duties.

17–120. Officers and enlisted men *when actually performing the duty* of provost guards should wear a blue brassard on the left arm half way between the elbow and shoulder bearing the letters "**M. P.**" in white. (Army designation for military police.)

17–121. As a rule, provost guards on duty will not be reprimanded or placed in arrest except by the superiors under whose command they happen to be. Members of the provost guard when not on duty, that is, when not wearing the blue brassard, have no special privileges.

17–122. The provost guard is detailed ordinarily as a complete organization, such as a company, or battalion.

17–123. The activities of a provost guard are restricted normally to a zone immediately adjacent to the camp or bivouac of the troops to which they are attached, or on the march, to the rear of the column.

When the entire theater of operations is similarly safeguarded by troops on detached duty, with special duties as above defined, they are known as **military police.**

Chapter 18

MARCHES AND CAMPS

Section I.—MARCHES

General Principles

18–1. A successful march, whether in peace or war, is one that places the troops at their destination at the proper moment and in the best possible condition. In war, marches are of daily occurrence, and success depends in a great measure upon the skill with which they are conducted.

Good marching is secured by careful preparation, strict discipline, and the due observance of march sanitation. (See ch. 23, Hygiene of the March, arts. 23-27 et seq.)

While conforming to other requirements, marches are conducted so as to reduce to a minimum the hardships of the troops.

Troops are informed of the length of halts so that they can take full advantage of the same.

The men are not kept under arms longer than necessary, nor required to carry heavy burdens when transportation is available.

Special care is paid to the feet of the men and the fitting of socks and shoes and to the hoofs and backs of animals.

In prolonged marches at least one day in seven should be a day of rest.

A forced march is never undertaken unless the situation requires it.

The conduct of a march (forming the column or columns, distribution of troops, the start, rate, length of march, etc.) is controlled by the situation and object to be accomplished.

The marching efficiency of a unit is judged by the amount of straggling and elongation, and the condition of men and animals at the end of the march.

Preparation

18–2. Warning orders are issued at the earliest practicable moment in order that preparations may be made thoroughly and without haste.

18–3. It is the duty of the commander to see that the necessary preparations are made; that the men and animals are in fit condition and that they are properly equipped; that all trains accompanying the command are loaded as prescribed; that proper measures have been inaugurated for the replenishment of supplies; and that the necessary arrangements have been made for the care and evacuation of the sick and wounded.

18–4. The training of infantry should consist of systematic exercises to develop general physique and of actual marching to accustom men to the fatigue of bearing arms and equipment and to train them in observance of the rules of march discipline.

18–5. With new or untrained troops, the process of hardening the men must be gradual. Immediately after muster into the service, the physical exercises and marching are begun. Ten-minute periods of vigorous setting-up exercises should be given three times a day to loosen and develop the muscles. One march should be made each day with full equipment, beginning with a distance of 2 or 3 miles and increasing the distance daily as the troops become hardened, until a full day's march under full equipment may be made without exhaustion.

18–6. A long march should not be made with untrained troops. If a long distance must be covered in a few days,the first march should be short, the length being increased each succeeding day.

18–7. Except for urgent reasons, marches should not begin before an hour after daylight, but if the distance to be covered necessitates either breaking camp before daylight or making camp after dark, it is better to do the former.

18–8. The position of companies in the battalion and of battalions in the regiment is ordinarily changed daily so that each in turn leads.

18–9. Special attention should be paid to the rate of march. It is greater for trained than for untrained troops; for small commands than for larger ones; for lightly burdened than for heavily burdened troops. It is greater during cool than during hot weather.

18–10. In large commands the marching capacity of troops is greatly reduced by faulty march orders and poor march discipline.

The halts and starts of the units of a column should be regulated by the watch and be simultaneous.

Closing up during a halt, or changing gait to gain or lose distance should be prohibited.

18–11. Each company and platoon commander inspects his unit before the commencement of the march and assures himself that arms and equipment are as prescribed, canteens filled, packs properly made up, supplies to be transported on wagons complete, properly marked, and prepared for transportation, etc. Commanders of units with transportation inspect the loading of wagons, adjustment of harness, etc. As far as practicable, fatigue and other details that will be required at the end of the march (digging latrines and refuse pits, pitching officers' tents, kitchen details, etc.) are made before the commencement of the march.

18–12. Forming the column.—To form the column for a march the commander issues the necessary orders (march order). (See arts. 19–47 et seq.)

The march order states the object of the march, gives the distribution of the troops, order of march of the main body, manner of forming the column, etc. If the command consists of two or more columns, the order of the supreme commander generally indicates the march to be made by each column, and the column commanders issue corresponding march orders.

The method of forming the column depends upon the size of the units, the location of their camps or quarters, and the tactical situation.

When troops are encamped or bivouacked at some distance from the road, columns of the size of a regiment and larger columns are formed by successive arrival at, or clearing of, an initial or starting point by subordinate units. The initial point, as a rule, is located in the direction of the proposed march. The commander fixes the initial point after considering the position of the troops and the roads by which they can join the column. He also prescribes the hour at which the leading fraction or fractions clear the initial point, and if necessary, the routes to be followed in reaching it. To prevent needless marching, he may designate special initial points for parts of the command.

As a general rule, the larger units of a command should be camped in the order in which they will march on the following day.

In drafting march orders, the road space and rate of march of the different fractions of the command and their distances from the initial point must be considered. With troops marching four abreast, artillery and trains in single column of carriages, the following may be assumed for approximate calculations: Two men per yard for foot troops, one man per yard for each mounted man, 20 yards for each gun, caisson, or wagon, 12 yards for each auto truck, and 8 yards for carts.

Commanders of subordinate units examine the route to be followed, calculate the time required, and start their commands in such manner that there will be neither delay or unnecessary waiting under arms either at the initial point or elsewhere.

They may designate initial points for their own commands. In every case the initial point should be of easy access.

When troops are located on or near the roads to be followed, the commander prescribes the hour of starting for the larger units; the subordinate commanders issue corresponding orders for their commands.

18-13. When commands camp in column along the route of march, they may be assembled in march column prior to the commencement of the march. Assembly or massing of the command prior to the commencement of the march may also be made necessary by uncertainty in the tactical situation when marches are conducted in proximity to the enemy.

Where several elements of a command, marching by different routes, are to unite on a single route or when their march routes cross each other, arrival at or clearing of road junction should be so timed as to prevent collision between columns.

The order of regiments in brigades, battalions in regiments, and companies in battalions is generally changed from day to day; the leading unit on any day forms at the tail on the following day.

When troops are to march to an assigned camping or billeting area, the location of the several elements of the command in the area should be considered in forming the columns.

18-14. Night marches are difficult, slow, and exhausting. Concealment of movement and other tactical considerations will, however, frequently require such marches (see Night Operations).

The different units of the column, including those of the train, are separated at the start by distances prescribed in these regulations or by the commander. These distances are temporarily increased or diminished, according to circumstances, thus facilitating uniform progress without checks and with a continual tendency to the gradual resumption of normal distances.

Section II.—CONDUCT OF THE MARCH

18–15. On the march, **troops keep to the right of road,** as far as practicable leaving the left free. Even when the roads are narrow, space should be left for messengers to pass freely along the column. When roads are soft with mud or heavy with sand or very dusty, it may be advisable to divide the column longitudinally so as to permit men and animals to pick their way; the middle of the road is kept clear. Care should be taken to prevent straggling or undue lengthening of the column.

18–16. The habitual march formation is column of squads.

On wide roads the march may be conducted in double column of squads when necessary; on narrow roads or trails in column of twos or files. In marching across country the commander adopts the most advantageous formation.

The elements of the column cover accurately in file and keep accurately dressed toward the side of the guide. Rifles are carried either slung vertically or in such a manner on the shoulder, muzzle up and elevated, as not to interfere with the man next in rear.

Cavalry marches in column of fours on good roads or when compact formation is desirable, otherwise in column of twos; artillery in single column of carriages or in double column if the width of the road permits.

As a rule, troops on the march pay no compliments; individuals out of ranks salute when they address, or are addressed by, a superior officer. The march is habitually at route step.

18–17. File closers, including officers, form additional ranks at the head and rear of the units. No one is permitted to march habitually outside of the column, which must at all times be orderly and compact.

18–18. An officer of each company marches at its rear in order to keep it closed up and prevent straggling.

No person is permitted to fall out without specific authority of an officer of his company. Authority is given only for the most urgent reasons. Men who fall out on account of sickness are given a written permit to be presented to the surgeon, who disposes of the case according to the necessity and notifies the company commander of the action taken.

18–19. If there are two battalion medical officers, the senior member marches with the battalion commander, and the assistant proceeds with the rear of the battalion. If there is only one battalion medical officer, he should march with the rear of the battalion, in order to be able to examine and treat disabled men falling out of the marching column. The sick and injured falling out should be tagged, treated, and sent to available vehicles, or otherwise provided for.

The battalion medical detachment marches in the rear of the battalion.

The regimental surgeon marches with the staff of the regimental commander.

The regimental medical detachment marches in the rear of the regiment.

18–20. In addition to the driver only one other person is permitted to ride on a field wagon. All other personnel with the regimental trains are formed and marched in one group, under the senior present, at the tail of each battalion transportation group. All men who accompany the field trains wear their full equipment, less the pack. The latter may be carried on the train.

Section III.—RATE AND LENGTH OF MARCHES

18–21. The rate of march varies with the length of the march, size of the command, condition and training of the troops, and other circumstances; sandy, rough, muddy, or slippery roads, great heat and dust, strong headwinds, and broken country reduce the rate. If hills are to be climbed or swampy country is to be crossed or defiles passed, liberal allowances are made in time calculations.

The rate prescribed for drill is 100 yards a minute or 3.4 miles an hour; on the road, the maximum to be counted on is 88 yards a minute or 3 miles an hour; including halts this rate is equivalent to 2½ to 2¾ miles per hour. The rate of infantry columns, under average conditions, may be assumed at 2¼ to 2½ miles an hour.

The average march of infantry is 15 miles a day; but in extensive operations, involving large bodies of troops, the average is about 12 miles a day. Small commands of seasoned troops, marching on good roads in cool weather, can average 20 miles a day.

The rate of march is regulated by the commander of the leading company of each regiment, or, if the organizations are separated by greater than normal distances, by the commander of the leading unit of the organization. A uniform rate should be maintained. The officer setting the pace constantly checks the cadence of his stride (which has been previously measured by marching over a measured course) against the watch, in order to regulate the march rate.

A forced march is never undertaken unless the situation requires it. As a rule, forced marches are made by increasing the number of marching hours rather than by accelerating the rate.

The rate of a wagon train varies with the class and condition of the draft animals, the load, length of the column, and the condition of the roads. While large mules drawing light loads on good roads can cover nearly 4 miles an hour, in long columns a rate of 2 miles, including halts, is all that can be expected even under favorable conditions; small trains may make 2½ miles an hour. The daily march of a wagon train is about the same as that of Infantry.

The average load of a pack mule is 250 pounds, and a train thus loaded can travel from 20 to 25 miles a day on ordinary roads or trails; over rough country, from 10 to 15 miles.

The rate of march, the load, and the distance that may be covered in a day with autotrucks or with tractors drawing wagons are dependent on the character and condition of the roads and the carrying or pulling power of the trucks or tractors.

18–22. The start.—When practicable, marches begin in the morning, ample time being allowed for the men to breakfast, animals to feed, and the wagons or animals to be packed. The time for reveille should be designated the evening before. Canteens are filled, fires put out, latrines covered, and the camp policed before departure.

The signals for striking camp and putting the command in march are ordered by the commanders of the larger units at the proper time. One or more officers of each organization superintend the preparations for the march.

The different units of the column, including those of the train, are separated at the start by distances prescribed in regulations or by the commander. These distances are temporarily increased or diminished, according to circumstances, thus facilitating uniform progress without checks, and with a continual tendency to the gradual resumption of normal distances.

18–23. Halts.—To rest the men and animals and for other purposes, a command on the march is occasionally halted. The first halt is made after marching about three-quarters of an hour, and is about 15 minutes long, to enable the men to attend to the calls of nature and to adjust their clothing, etc. Judgment should be exercised in selecting the place for the first halt; it should not be made in a village or place where one of the objects of the halt would be defeated.

After the first rest, there is for foot troops a halt of about 10 minutes every hour—that is, the troops march 50 minutes and then halt 10. In very hot weather the halts may be longer and more frequent. The men are allowed to fall out, but remain in the immediate vicinity of their places. (See art. 23–34.)

As a rule, troops prefer to finish a day's march as soon as possible. In good weather, with favorable temperature, long halts are not desirable on marches of less than 15 miles for Infantry or 25 miles for mounted men. When the day's march will run well into the afternoon, a halt of about one hour near mealtime is advantageous. Places for long halts should be selected with care; wood, water, grass, dry ground, and shade are desirable features. Arms are stacked and equipments removed; mounted troops dismount and loosen cinches. (See art. 23–74.)

In hot weather, especially in the Tropics, it may be desirable to avoid the midday heat. If the march is long, the command may make an earlier start, or it may rest for three or four hours during the hottest part of the day and finish the march in the evening. As a general proposition, however, it is undesirable to arrive at a strange place after nightfall or even late in the afternoon.

Halts are not made in or near towns or villages unless to procure water or supplies, and when so made the men remain in column, details being sent for whatever is necessary.

Halts may be made pursuant to signal or at hours specified by the c. o. of the troops (e. g., hourly halts, to be made uniformly at 10 minutes before the hour). In the latter case, all units halt and resume the march at the time specified.

18–24. Distribution of troops.—The order of march of a column is controlled mainly (1) by tactical considerations, which are paramount in the presence of the enemy, and (2) by the rule requiring the hardships of troops to be reduced to a minimum. (See arts. 17–74 et seq.)

The order of march of the main body is determined by the contemplated employment of the troops. When contact with the enemy is probable, columns are closed up and march on broad fronts; communication is maintained between the columns on parallel roads, and all impedimenta not necessary in the conflict are kept in the rear. If a part of a unit of Infantry is assigned to the advance guard, the remainder of that unit usually marches at the head of the main body.

During the advance, the Artillery, in order to expedite its entry into action, is generally near the head of the main body, sufficient Infantry leading to insure proper security. Its commander usually accompanies the commander of the column. If there is danger to the flanks from small bodies of the enemy, the Artillery may be broken into columns not longer than a regiment; it then marches like a convoy with Infantry in front, in or opposite the center, and at the rear. This formation of necessity delays the entry into action of a part of the Infantry; to reduce this delay the Artillery marches, if possible, in double column, and its combat train follows immediately in rear of the last Infantry unit. When moving into action the Artillery has the right of way.

During an advance the order of march of a column is generally as follows:

1. Advance guard.
- (*a*) Infantry with machine guns.
- (*b*) Pioneer detail.
- (*c*) Artillery detachment (if required).
- (*d*) Ambulance party.

2. Main body.
- (*e*) Infantry (battalion or regiment).
- (*f*) Machine guns (if separately organized).
- (*g*) Artillery (less advance guard detachment).
- (*h*) Infantry (less battalion or regiment mentioned in (*e*)).
- (*i*) Pioneers (less advance-guard detachment).
- (*j*) Ambulance party (less advance-guard detachment).
- (*k*) Ammunition train.
- (*l*) Supply train.
- (*m*) Provost guard.

3. Rear guard (when required).

18–25. During a retreat the order of march is practically the reverse of the above.

A detachment of pioneers usually marches near the head of each column to repair roads, strengthen bridges, etc.

On marches through long defiles or dense forests or on night marches it may be advisable to place the Artillery near the rear of the column.

18–26. Trains.—Military trains are at all times provided with the necessary guards. Field trains are guarded as far as practicable by men on duty with the train, by convalescents and other noneffectives, and by dismounted men. In marches into action the trains are held far enough in rear not to interfere with the movements of troops or to check withdrawal in case of defeat.

If a wagon breaks down or is stalled, its load is transferred to other wagons and the road cleared as soon as practicable.

Stream Crossings, Defiles, and Obstacles

18–27. When a cause of delay—for example, a damaged bridge—is encountered, the troops in rear are notified of the minimum length of the delay; they then conduct themselves as at regular halts.

In ascending or descending slopes, crossing streams or other obstacles, or passing through defiles requiring a reduction of front, every precaution is taken to prevent interruption of the march of the troops in rear. If the distances are not sufficient to prevent check, units are allowed to overlap; if necessary, streams are crossed at two or more places at the same time; in passing through

short defiles the pace is accelerated and the exit cleared at once. If a company is delayed while crossing an obstacle, the head of the company slackens the pace or halts a short distance beyond the crossing until all of the company has passed and has closed up; it then regains its distance, increasing the pace if necessary.

Careful examination is made of fords, boggy places, bridges of doubtful character, ice, etc., before attempting a crossing.

When necessary an officer is designated to superintend the crossing; his instructions must be strictly observed, the troops crossing in the formation prescribed by him. Troops crossing bridges march without cadence.

Whenever a military bridge is constructed with the bridge equipage, or, if deemed necessary, in cases where improvised material is employed, a bridge-guard officer will be detailed for its care and maintenance during the period of its use. All orders, regulations, and instructions issued by this officer will be considered as emanating from the commander of the force crossing the bridge.

When roads lead through swamps or quicksand or across streams with treacherous bottoms their limits are marked with stakes or bushes, or warnings are placed at dangerous points. At night, lanterns are hung from the stakes, and a fire is built or a lantern hung to mark the landing.

When the current is strong and the water deep foot troops cross on as broad a front as possible, the men marching abreast and holding hands. They should not look at the water but at the opposite shore.

Fords that are at all difficult delay long columns, unless the troops cross at several places at once. The crossing of many animals or wagons may deepen a ford and render it impassable; new places may thus become necessary.

The men enter pontoons or barges singly at the bow or stern, and gradually move toward the stern or bow; larger vessels may be entered in column of twos; the men retain the places assigned them so as not to interfere with the handling of the boat; in small boats when the water is rough, they sit down; when there is danger of capsizing, they are directed to remove equipments.

Horses are loaded one at a time. When there is room for a single row only, they alternate heads and tails; if in two rows, they face inward. If a horse falls into the water, it is turned loose.

Wagons are generally loaded by hand; if practicable, the teams are sent on the same vessel.

Unloading is also from the bow, in good order, without crowding; men sitting down do not rise before their turn.

When rafts are used, special precautions are necessary. The center of the raft is first occupied and then the load uniformly distributed. Unloading is carried out in inverse order, the center of the load being last to leave.

Care of Troops

18–28. On the march, commanders of the larger units keep themselves informed of the condition of their commands and of the progress of subordinate units in rear.

Sources of water supply are examined by experts and marked good or bad. In countries infected with cholera or other harmful bacteria, this examination is imperative.

The drinking of any other beverage than potable water on the march is prohibited. Thirst should be quenched before starting by frequent small sips of water. On a march of ordinary length, the use of water should be limited to rinsing the mouth or the consumption of small amounts if the exertion is considerable or weather conditions require it. The drinking of water is often a matter of habit; under ordinary conditions, a canteen of water should last a day's march. Soldiers should be trained to be economical in the use of water and to keep a small supply until their canteens can be replenished.

Commanders afford the men ample opportunity for replenishing their canteens, but this is done by order, not by straggling from the command. In certain cases the inhabitants may be required to place water in vessels along the line of march for the convenient use of troops. A reserve supply of water for use in emergencies is carried on water carts or wagons. On long marches through country deficient in water or where the water is bad, special measures for the organization of the water supply will be necessary. (See art. 23–39 and arts. 23–46 et seq.)

Rations or lunches are not consumed until permission is given by the company commander.

Animals of wagon trains are watered while in camp—before departure and after arrival—or during a long halt. If time permits they may be watered on the march from buckets or by unhitching and riding or leading to water.

One of the greatest sources of hardship on a march, especially for infantry, is hot weather. Every precaution is taken to prevent suffering from this cause. Halting places are selected when practicable where there is shade and free circulation of air, and the men are cautioned against drinking too much water. Green leaves or moist handkerchief in the hat afford relief from the hot rays of the sun. If the men are overheated care is taken to prevent them being chilled by exposure to cold winds or drafts.

Abraded and blistered feet should be promptly dressed. At the end of each march company commanders will, when practicable, require that feet be bathed and dressed and footgear changed.

18–29. Forced marches.—The conduct of forced marches is controlled by the distance to be covered and the time in which the march is to be accomplished. As they seriously impair the fighting power of even the best troops, forced marches are undertaken only in cases of necessity. Long forced marches can not be made without unjury unless the command is in good condition and the march is made with good judgment. The difficulties of the problem rapidly increase with the size of the command and the length of the march, but in any case the completion of the march should find the troops in condition to accomplish the object of the march.

With foot troops forced marches are generally made by increasing the number of marching hours, the halts and periods for cooking and sleep being arranged so as to afford the maximum benefit. The rules prescribed for the average march are followed as closely as possible. For large columns of infantry, marching long distances, increase of pace is seldom of value.

A maximum day's march for infantry and trains is about 28 to 30 miles. A march of this character can not, as a rule, be prolonged more than 36 hours. If a forced march is to continue for several days, it becomes practically a succession of daily marches of more than average length.

Foot troops are favored in every way possible. They are assigned the best roads, and not intermingled with vehicles or mounted men. If transportation is available, their packs are lightened.

18–30. Night marches.—Night marches are sometimes made in hot weather; generally, however, they are made as the result of a forced march to surprise the enemy or to secure a favorable position from which he may be attacked at night or at dawn.

Moonlight and good roads are favorable for night marches. A waning moon is of advantage in marches beginning early in the morning. As all-night marches rapidly impair the efficiency of a command a few hours' rest should be taken, if practicable. Special effort is necessary to maintain good march discipline.

Precaution is taken that the proper road is followed and that contact between units is maintained, men being stationed to mark changes of direction. If necessary, guides are secured and charged with the duty of following the right road. When, due to unfavorable conditions, units can not be kept well closed men will be placed at forks and crossings of roads, especially on dark nights and at times of dense fogs or storms, and always when passing through cities or towns from which roads diverge in many directions.

When the march is secret, additional precautions are necessary. Silence is maintained; mouthpieces of bugles are removed, and articles of equipment secured to prevent rattling; smoking is not permitted; villages and farmhouses are avoided on account of warning given by dogs. If the troops are compelled to leave the roads, their progress will be slow, and additional time allowance must be made.

Section IV.—CAMPS, BIVOUACS, AND CANTONMENTS

18–31. Camp or bivouac.—As a command approaches the camping place the commander issues the halt order. This order provides for the outpost, if necessary, and gives instruction for the encampment of the command.

18–32. When troops are sheltered under canvas, they are in **camp.** When resting on the ground without shelter, they are in **bivouac.** When occupying buildings in towns or villages, or huts specially erected, they are in **cantonments.**

Cantonments often develop through improvement of camps—huts or temporary buildings taking the place of tents. During a prolonged suspension of hostilities, the occupation of enemy territory, and at sieges, cantonments are advantageous, especially in cold or wet weather.

Billeting is the assignment of troops to public or private buildings for quarters.

The Selection of Camp Sites

18–33. In campaign, tactical necessity may leave little choice in the selection of camp sites, but under any conditions, the requirements of sanitation should be given every consideration consistent with the tactical situation. (See arts. 23–40.)

18–34. In general, the following principles govern the selection of camp sites:

The site shall be convenient to an abundant supply of pure water.

Good roads should lead to the camp. Interior communication throughout the camp should be easy.

Wood, grass, forage, and supplies should be at hand or easily obtainable.

The area should accommodate the command without crowding and without compelling the troops of one unit to pass through the area of another.

The site should be sufficiently high and rolling to drain off storm water readily, and if the season be hot, to catch the breeze. In cold weather, it should preferably have a southern exposure with woods to the north to break the cold winds. In warm weather, an eastern exposure, on ground moderately shaded by trees, is desirable.

The site should be dry. For this reason, porous soil, covered with stout turf and underlaid by a sandy or gravelly subsoil, is best. A site on clay soil or where the ground water approaches the surface is damp, cold, and unhealthful.

Alluvial soils, marshy ground, and ground near the base of hills, or near thick woods or dense vegetation, are undesirable as camp sites on account of dampness. Ravines and depressions are likely to be unduly warm and to have insufficient or undesirable air currents.

Proximity to marshes or stagnant water is undesirable on account of the dampness, mosquitoes, and the diseases which the latter transmit. The high banks of lakes or large streams often make desirable camp sites.

Dry beds of streams should be avoided; they are subject to sudden freshet.

18–35. The occupation of old camp sites is dangerous, since they are often permeated by elements of disease which persists for considerable periods. Camp sites must be changed promptly when there is evidence of soil pollution or when epidemic disease threatens, but the need for frequent changes on this account may be a reflection on the sanitary administration of the camp.

18–36. Form and dimensions of camps.—The forms of the camp should be such as to facilitate the prompt encampment of troops after a march and their prompt departure when camp is broken. The form of camps will depend upon the tactical situation and the amount and nature of ground available. In certain cases, particularly in one-night halts in the presence of the enemy, camps must of necessity be contracted, while in other cases, where a more extended halt is contemplated and where tactical reasons will permit, better camp sanitation may be secured, and a more comfortable arrangement made by the expansion of camp areas.

The figure gives the general form, dimensions, and interior arrangements of a regimental camp where the area of available ground is ample. (See fig. 226.)

Under similar favorable conditions, the brigade may camp in column or in line of columns. In the latter formation the interval between regiments should be about 50 yards. When the camp site has a restricted area, intervals and distances are reduced.

Under service conditions, camp sites that will permit the encampment of regiments and brigades as above indicated will not often be available and regularity must be sacrificed.

18–37. Establishing the camp.—Camp is established pursuant to the halt order. This order provides for the outpost, if necessary, and gives instructions for the encampment of the main body. When practicable, large commands are encamped by brigades.

The camping ground may be selected by the supreme commander, but in large commands is generally chosen by a staff officer sent forward for that purpose. This officer, with a representative from each regiment and a medical officer precedes the command, selects the camping ground, assigns sections thereof to the larger fractions of the command, and causes them to be conducted to their respective sections on arrival. He also designates the place for obtaining drinking and cooking water, for watering animals, for bathing, and for washing clothing in the order named, from upstream down. (See art. 23–51.)

On the arrival of the troops, guards are posted to enforce proper use of the water supply; the interior camp guards proceed to their places, and after posting sentinels, pitch their tents. The remaining troops pitch tents and secure animals and equipment; kitchens are established and details made to procure fuel, water,

forage, etc., and to prepare latrines (sinks) and kitchen pits (see arts. 23–54 et seq.); if necessary, tents, company streets, and picket lines are ditched.

In the presence of the enemy, places of assembly for the troops are designated and directions given for their conduct in case of attack. Lines of information are established with the outpost.

18–38. Bivouacs.—On marches or in the presence of the enemy troops are frequently forced to bivouac on account of lack of suitable ground or for tactical reasons. On the other hand, in fine weather, in midsummer, or in the dry season in the tropics, the troops may bivouac from choice.

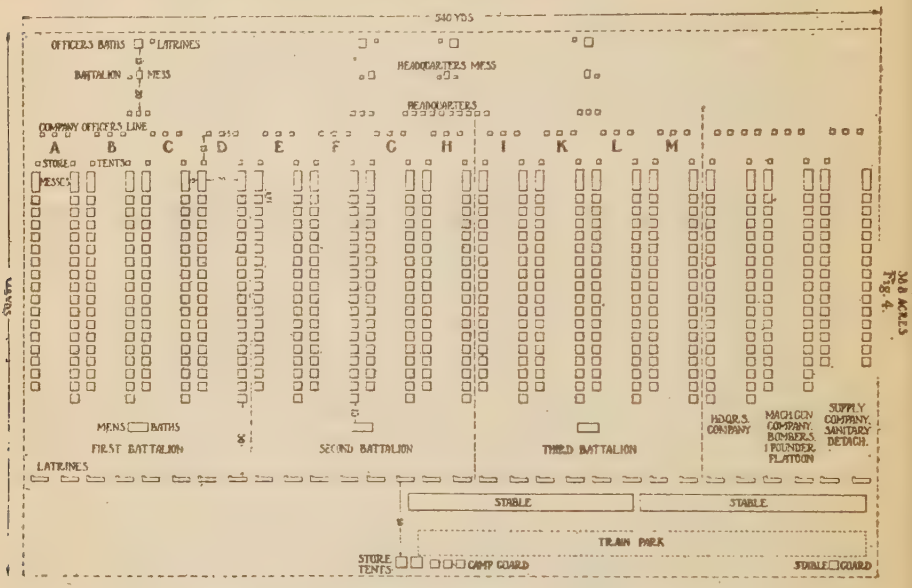

FIG. 226.—Camp of a regiment of infantry. War strength

From the tactical point of view, bivouacs are very convenient, but for sanitary reasons they are resorted to, as a rule, only when necessary. The general principles governing the selection of camp sites apply to bivouacs. The ground should be dry and protected against sun and wind. Light woods are nearly always good sites for infantry bivouacs, on account of the shelter and material available.

In the artillery on marches from day to day the men may be permitted to sleep under carriages or tarpaulins covering the harness, thus obviating the necessity of pitching tents.

Shelter During Battle

18–39. During a lull in an engagement, or when hostilities are suspended for the night, the troops bivouac in line of battle on or near the position they occupy, the officers in rear of the center of their units. Reserves required to remain in instant readiness generally bivouac in column with a flank to the front. After the outposts are established, the commander of the main body decides whether the troops shall use their shelter tents or not.

Section V.—BILLETING

Preparations

18–40. Arrangements for sheltering troops should, as far as practicable, be made before their arrival. The preparations for quartering a command are made by means of quartering parties. Quartering parties are sent out not only by troops changing stations but also when practicable by troops on the march, whether they are to be sheltered in billets or in camp.

18–41. The duties of quartering parties are:

To select the billeting area when this has not been already definitely determined and make arrangements for its occupancy with the proper authorities;

To apportion the billeting area among the subordinate units of the command, and allot to each the available facilities for its administration and supply;

To reserve facilities for the general service of administration, supply, and command (interior guards, headquarters, infirmaries, etc.);

In special cases to secure supplies;

In general, to take the necessary measures to insure that all agencies of command, administration, and supply continue functioning with the least possible interruption after the arrival of the command.

18–42. The basis of the apportionment is the quartering capacity of the town or area obtained from the town major, the local authorities, or by other means, and the strength of each unit in officers, men, animals, and vehicles furnished by the command.

Billets are allotted by the assignment of sections of the town to units. Subordinate units re-allot subsections, streets, or houses to their component units. Companies allotted to a street should occupy both sides of the street.

Each section should have easily recognizable boundaries.

When tactical considerations are controlling, the distribution of the troops must be made with regard to combat. Machine-gun companies and 1-pounder and light-mortar units should be near their carts on the side of the town opposite to the enemy.

Units with animals and transportation are billeted or camped near watering places and places suitable for the parking of wagons.

In arranging camps, bivouacs, or billets, battalions, companies, platoons, and squads will be kept together in order to facilitate control.

The minimum floor space required for each man in billets is 6¾ feet by 2½ feet. Wherever space permits, each man should have 40 square feet of floor space. When space in buildings is insufficient for billeting the entire command, a portion of the command may be camped or bivouacked in gardens, public squares, etc., or outside of the town (close billets).

18–43. The composition of a quartering party will vary, depending on the time and transportation available, and whether the command is on the march in campaign or changing station or billeting area.

18–44. A quartering party of a regiment on the march will comprise:

A line or tactical staff officer (quartering officer);

A supply officer;

A medical officer;

Battalion c. p. o. or other representative from each battalion;

Mess p. o. and supply p. o. of each company.

When practicable, the quartering party will include the officer of the day, a detail of the guard, and two men of each company for fatigue.

Motor cycles, bicycles, or mounts should, when necessary, be supplied to members of the quartering party.

A quartering party of a battalion acting alone or in a detached area is similarly constituted.

The quartering officer commands the quartering party. When several units are to occupy the same area, the senior quartering officer is in command of all parties.

The quartering officer places the quartering party in charge of the senior seaman present and directs it to proceed to a designated point in or near the quartering area. Accompanied by the supply officer, medical officer, and several seamen, he then proceeds to the quartering area. On arriving in the quartering area he arranges with the town major, the local officials, or private parties for the necessary areas, shelters, or supplies. He allots areas, sections, or districts to the battalions, the machine-gun company, headquarters company, and supply company and reserves suitable accomodations or locations for regimental headquarters, the guard, and the infirmary. He locates an assembly place for the regiment (usually outside of the town or on the side of the camp toward the enemy) and designates water sources for men, animals, and bathing. He requires the medical officer to determine and report upon the sanitary conditions of the area and its water supply. He placards contaminated water sources and forbidden areas, arranges for traffic control, police regulation, and prevention of fires. On arrival of the guard detail, he posts a guard for the proper security and control of the area (sentries over water sources, at village exits, etc.).

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18–45. Battalion c. p. o's. select from the area or district allotted to them suitable accommodations for battalion headquarters and staff, locate if necessary a battalion assembly place, and distribute the battalion area to the companies. Supply p. o's. representing companies determine the capacity of shelters and subdivide the area among the platoons, reserving a proper place for company headquarters, officers' quarters, kitchens, stables, and latrines, select a company assembly place, and placard the company area so as to show all assignments. The mess p. o. secures the necessary supplies.

In the case where camps are to be established the location of the different units and their officers' quarters, kitchens, picket lines, and latrines is established in accordance with the plan fixed by the quartering officer (fig. 226).

After the quartering officer has completed his dispositions, he rejoins the command, accompanied by the medical officer, and reports to the commanding officer of the troops. Battalion and company quartering parties remain in the quartering area, and when necessary and practicable send a seaman to their organization commanders to serve as a guide.

On arriving in the quartering area companies are marched to their assembly places, and before being marched to their quarters the men are instructed as to the location of the company assembly place, company headquarters, and the regimental or battalion infirmary, and as to messing arrangements, time of next assembly, service calls, and the local orders and regulations in force. Details for guard, fatigue, etc., are published and the sick are formed and sent to the infirmary for treatment.

When the command is to be sheltered in billets the companies should be held at their assembly places until all billeting arrangements are completed. Each platoon leader then marches off his platoon; before dismissal he informs his men as to the location of his own quarters and those of the c. c., and as to the hour when men are to be permitted to leave the platoon area assigns squads to their shelters, makes arrangements for lighting, preparations for extinction of fire, digging of latrines, placing of urinal buckets, etc. He inspects his area, requires it to be properly policed, and orders the necessary cleaning of arms and equipment.

18–46. When in close proximity to the enemy and troops must be disposed in camp or bivouac in accordance with tactical requirements the reconnaissance of the camp site and the distribution of units must be made by the commanding officer of troops.

Administration

18–47. When troops of different organizations are sheltered in the same town or camp the senior line officer is the town or camp commander.

The camp or town commander regulates interior and exterior guard service, traffic control, police control of seamen and, in hostile territory, of the inhabitants, the readiness of the command for action, and if a town major has not been assigned to the town, the distribution of quarters to incoming units, and all relations with the civil authorities. The town commander may designate an acting town major when a permanent town major has not been assigned to the town.

18–48. The duties of the acting town major will vary widely, depending on the length of occupancy of the billeting area by the command and on whether the area is in friendly or hostile territory. Duties which may be assigned to him include:

The conduct of all transactions between the troops and the civil authorities and inhabitants;

The keeping of a complete and accurate list of all accommodations, showing for each building or premises the capacity in officers, men, offices, storerooms, animals, and other needs to be anticipated;

The assignment of accommodations to incoming troops and preparation of a supply of rough maps for their use.

Location and maintenance of suitable latrines, baths, water, washing and incinerating facilities;

Arrangements for the disposal of refuse, fire protection, and traffic regulation;

Establishment of necessary direction signs at all points where they will be of service;

Marking of buildings and premises as to capacity and use;

In hostile territory, police surveillance of the inhabitants, counter-espionage measures, etc.

In regiments and larger units a senior officer may be assigned to this duty and charged with supervision of the service of interior guards and other security measures.

18–49. In each camp and occupied town an officer of the day is detailed. He reports to the camp or town commander for orders, or to the acting town major when the guard is under the latter's orders. He is in command of all interior guards and is responsible for the execution of the necessary security measures, police regulations, and standing orders.

In each battalion one officer, in each company one p. o., are detailed to remain constantly on duty in the battalion or company. Immediately after their arrival in camp or cantonment they report for instructions to the officer of the day. They are responsible for the maintenance of order and the execution of all regulations or orders given by the camp or town commander or the commander of their unit. They communicate all instructions received to their organization commanders at the first opportunity.

18–50. An interior guard is established in each camp and occupied village. Sentries should be posted at village exits, over picket lines, and wagon parks. Each unit furnishes the sentries required within its own section or area; such sentries constitute part of the camp or town guard and are posted under its direction. The establishment of exterior guards (outguards, provost guards) may also be necessary.

The conduct of interior guards is governed by the provisions of the manual of guard duty.

Special security measures are necessary in the case of occupied towns in hostile territory (stronger guards, patrolling in and in the vicinity of the town, guarding bridges, searching houses for telephone installations, holding of hostages, quartering of men in assembled units, closing of exits to all except military traffic, etc.).

18–51. When commands are billeted in towns, special precautions for the prevention of fire should be taken (provision for buckets filled with water, regution of cooks' fires, etc.). The use of lights must be restricted and controlled, especially where there is danger of aerial bombardment.

18–52. When quartered in the theater of active operations, each unit must be in such state of readiness for action that it can prepare to move on the shortest possible notice. Men sleep fully dressed arms and equipment close at hand. On the sounding of the **call to arms, assembly,** or **fire call,** units assembled at their prescribed assembly places, and proceed to the assembly place of the next higher unit or to other specially designated points.

Assembly places should be so located that units or members thereof do not cross each other's path in assembling.

18–53. Under circumstances where hostile aerial bombardment may be expected, concealment and dispersion of the camp in order to avoid or minimize its effects are necessary. Concealment can best be secured by camping in wooded areas; measures must be taken to prevent betraying the location of the camp through the formation of paths or trails. In permanent or semipermanent camps or cantonments partial protection against the effects of aerial bombardment is secured by the construction of embankments around huts or tents, by sinking the floors below the ground level, or by excavating lengths of zigzag trench to be occupied in case of alarm. Lookouts are posted to give warning of the approach of hostile aircraft, and provision made for sounding the alert. Troops at drill, when necessary, establish lookouts for the same purpose.

During concentrations prior to and during operations, troops and transportation in billets must be kept under cover from aerial observation during daylight hours.

18–54. The quarters of the camp or town commander should be so located that they can be easily found; at night, they should be marked by a shaded lantern. All sentries should be instructed as to the location of the commander's quarters so that messengers can be directed to it. Placards showing the name of the town and unit occupying it and the direction of routes should be posted at town exits.

Water Supply

(See arts. 23–46 et seq.)

18–55. Immediately on making camp, bivouac, or billets, a guard should be placed over the water supply. If the water be obtained from a stream, places should be designated: (1) For drawing water for drinking and cooking; (2) for watering animals; (3) for bathing and washing clothing. These are located in the order stated, beginning upstream.

If the stream be small, the water supply may be increased by building a dam. Small springs may be dug out and lined with a gabion, a barrel or box with both ends removed, or with stones; the space between the lining and the earth is filled

with puddled clay. A rim of clay is built around the spring to keep out surface drainage. The same method may be used in constructing small reservoirs near the borders of swamps, streams, or lakes for the purpose of increasing or clarifying the water supply.

Improvised Kitchens

18–56. Camp kettles can be hung on a support consisting of a green pole lying in the crotches of two upright posts.

A narrow trench for the fire, about one foot deep, dug under the pole, not only protects the fire from the wind but saves fuel. A still greater economy of fuel can be effected by digging a similar trench slightly narrower than the diameter of the kettles, placing the kettles on the trench and filling the space between the kettles with stones, clay, etc. A flue is thus provided running beneath the kettles. The trench should be dug in the direction of the wind. The draft can be improved by building a chimney of stones, clay, etc., at the leeward end of the flue.

Four such trenches radiating from a common central chimney will give one flue for use, whatever may be the direction of the wind.

A slight slope of the flue, from the chimney down, provides for drainage and improves the draft.

18–57. A lack of portable ovens can be met by ovens constructed of stone and covered with earth to retain the heat. If no stone is available, an oven may be constructed by laying an empty barrel with one head out on its side and covering it with wet clay to a depth of six or more inches and then with a layer of dry earth of the same thickness. A clay flue is constructed above the closed end of the barrel, which is then burned out with a hot fire. This leaves a baked clay covering for the oven.

An oven can be similarly constructed with boards or even brushwood, supported on a horizontal pole resting on upright posts, covered and burnt out as in the case of the barrel.

An oven may be constructed by excavating a recess in a clay bank.

To bake with ovens of the type above described, first heat them and then close flues and ends.

18–58. Food must be protected from flies, dust, and sun. Facilities must be provided for cleaning and scalding the mess equipment of the men. Kitchens and the ground around them must be kept scrupulously clean.

18–59. Solid refuse should be promptly disposed of by being burned in the kitchen fire or in an improvised crematory, or by burial or by removal by scavengers.

18–60. In temporary camps, if the soil is porous, liquid refuse from the kitchens may be strained through gunny sacking into seepage pits dug near the kitchen. Flies must not have access to the pits. Boards or poles, covered with brush or grass and a layer of earth, may be used to cover the pits. The strainers should also be protected from flies. Pits of this kind, dug in clayey soil, will not operate successfully. When troops camp or bivouac for one night only, shallow kitchen sinks should be dug. If cooking be individual, the men should be required to build their fires on the leeward flank of the camp or bivouac.

Before marching, all sinks should be filled in, mounded, and marked.

Disposal of Excreta

(See arts. 23–56 et seq.)

18–61. Immediately on arrival in camp, bivouac, or billets, sinks should be dug. This is a matter of fundamental sanitary importance, since the most serious epidemics of camp diseases are spread from human excreta, by carriage of elements of disease from them by flies, or by the pollution of the water supply through drainage into it.

Section VI.—CARE OF TROOPS

18–62. Lack of sufficient rest renders troops unfit for hard work and diminishes their power of resisting disease. Therefore commanders should secure for the troops, whenever possible, their accustomed rest.

The unit commanders are responsible for the maintenance of the sanitary condition of their camp and environs.

Men should not lie on damp ground. In temporary camps and in bivouac they raise their beds, if suitable material, such as straw, leaves, or boughs, can

be obtained, or use their ponchos or slickers. In cold weather and when fuel is plentiful the ground may be warmed by fires, the men making their beds after raking away the ashes.

When troops are to remain in camp for some time all underbrush is cleared away and the camp made as comfortable as possible. Watering troughs, shelter in cold weather, and shade in hot, are provided for the animals, if practicable.

In camps of some duration guard and other routine duties follow closely the custom in garrison. The watering, feeding, and grooming of animals take place at regular hours and under the supervision of officers.

The camp is policed daily after breakfast and all refuse matter burned.

Tent walls are raised and the bedding and clothing aired daily, weather permitting.

Arms and personal equipments are kept in the tents of the men. Horse equipments and harness are placed on the tongues of the wagons and covered with tarpaulins.

The water supply is carefully guarded. When several commands are encamped along the same stream this matter is regulated by the senior officer.

If the stream is small, the water supply may be increased by building dams. Small springs may be dug out and lined with stone, brick, or empty barrels. Surface drainage is kept off by a curb of clay.

General Remarks

18–63. As soon as the lines of company streets are established, the positions of the tents should be marked from the flank nearest the officers tents by pins. The right (left) front corner of the wall and common tent, and the door pins of the conical wall tents occupy the points so marked. The distance between pins may be determined by pacing, or by a light cord with the distances marked upon it. These distances are: For wall tents, 8 paces; common tents, 6 paces; conical wall tents, 10 paces; and pyramidal tents, 12 paces. The pins marking the position of the tents are, when practicable, set on a straight line, and the company officers verify and correct the alignment of such pins in the quickest and most convenient manner. (See Tent drill art. 18–68 et seq.)

Wall pins are so driven as to slope slightly away from the tent; guy-pins, so as to slope slightly toward the tent.

Each tent, its fly, hood, poles, and tripod should have the same number.

Working Parties

18–64. On arriving at the ground selected for the camp the following parties should be told off, each in charge of a p. o., and their duties assigned by the c. c.: (1) Sink party; (2) water party; (3) ration party; (4) wood party.

Section VII.—DAILY ROUTINE IN CAMP

Roll Calls

18–65. There should be, daily, at least three roll calls, viz, at reveille, retreat and tattoo. They will be made on the company parades by the c. p. os., superintended by an officer of the company.

At all established roll calls, except dress parade, after the companies are dismissed, each officer superintending the company roll call reports to the bn. adj., or other officer designated, the result of the roll call; the bn. adj., or other officer designated, reports the result of the roll call to the rg. adj.

Immediately after reveille roll call, the tents or quarters and the space around them will be put in order by the men of the companies, superintended by the p. os., and the guardhouse or guard tent by the guard or prisoners.

Daily, before 8 a. m., c. cs. will sign and forward the morning reports of their respective companies to the bn. c. These reports will be consolidated by the bn. adj. for the information of the bn. c., who will sign and forward a copy to the rg. c. Similarly the battalion reports will be consolidated by the rg. adj. for the information of the rg. c., who will sign and forward a copy to the bg. c., or senior officer present.

Routine Calls

18–66. The commanding officer establishes the hours for the different calls, having regard to the season and circumstances.

1. **Reveille** is usually sounded about sunrise.

2. **Breakfast call** should be sounded as soon after reveille as practicable, allowing the men time to wash themselves and put their tents or quarters in order. Usually no work or drill will be ordered before breakfast.

3. **Sick call** in time to allow the company c. p. os. to obtain from the medical officer a list of the men they are to report as sick on their morning reports.

4. **Fatigue** is the signal for policing camp or quarters, and for working parties to commence work.

5. **Chief petty officers' call** is the signal for the morning reports to be sent to the battalion headquarters.

6. **First call** is the first signal for formation for roll call and for all ceremonies except guard mounting.

7. **Guard mounting** is the first signal for guard mounting, which, when held in the morning, usually follows morning parade.

8. **Assembly** is the signal for companies or details to fall in on the company parades.

9. **Drill call** is usually sounded after the morning fatigue duties have been performed, or after dinner.

10. **Recall from drill** is the signal for the drill to cease.

11. **Dinner call**, usually at noon.

12. **Retreat** at sunset, when troops may be paraded under arms, weather permitting; orders and details for the following day are published then.

13. **Supper call** generally follows parade.

14. **Tattoo** not earlier than 9 nor later than 10.30 p. m.

15. **Taps** from 15 to 30 minutes after tattoo.

16. **To arms** is the signal for the men to fall in, under arms, on their company parade grounds, as quickly as possible.

17. **The general** is the signal to break camp and prepare to march.

18–67. Distinguishing flags and lanterns.

Distinguishing.	Day.	Night.
Headquarters (brigade)	The flag, or senior officer's pennant according to the rank of the bg. c.[1]	Three white lanterns.
Regimental commanders	None [1]	Two white lanterns.
Battalion commanders	do [1]	One white lantern.
Guard tents	Guard flag	One red lantern.
Hospitals	Hospital flag	One green lantern.

[1] Brigade, regimental, and battalion office tents should be marked with appropriate sign boards. Companies should be similarly designated with sign boards, giving the company number or ship designation.

Section VIII.—TENT DRILL

Pitching Single Shelter Tents

18–68. Purpose.—The purpose of this exercise is to enable the unit commander to establish his unit rapidly and correctly in single shelter tents, arranged in a neat and orderly way.

18–69. Formation.—The company commander forms the company in column of platoons on smooth or level ground suitable for instruction. During the instruction, if level ground is not available, the normal formation may be departed from sufficiently to indicate to the men the correct manner of taking advantage of the ground in camping. When tents are pitched on broken or rolling ground, the company commander indicates the general disposition for platoons. Platoon commanders provide for the proper disposition of tents in their own platoons. Except at inspection the alignment should always be subordinate to the proper employment of ground in camping.

18–70. Commands.—*a.* **FORM FOR SHELTER TENTS.**

b. 1. **Take interval**, 2. **To the right (left)**, 3. **MARCH**, 4. **Company**, 5. **HALT.**

c. **PITCH TENTS.**

18–71. Execution.—*a. Forming.*—At the command **Form for shelter tents** the file closers fill blank files. Men taken from the left (right) of the platoon concerned fill any remaining blank files; surplus file closers and members of platoon headquarters take position as additional files on the flank away from the point of rest.

b. Taking intervals.—At the commands for taking interval, the movement is executed as prescribed in the school of the squad.

c. Pitching.—(1) At the command **Pitch tents** each front-rank man draws his bayonet with his left hand and thrusts it into the ground, ring to the front, outside of and against his left heel near the instep. The bayonet marks the position for the front pole of the tent. Men armed with the pistol mark the place with the left heel. At the same time each rear-rank man moves to the front and places himself in the center of the interval, to the right of, and on line with his front-rank man. (See fig. 227.)

FIG. 227

FIG. 228

(2) Each man steps off obliquely to the right with the right foot, a full pace, lays his rifle on the ground, muzzle to the front, barrel to the left, butt near the toe of his right foot. He then steps back into place. All men then unsling equipment and place the packs on the ground in front of them. They then open their packs and remove their shelter halves, poles, and pins. The men of each file spread their shelter halves on the ground the tent is to occupy, triangle to the rear, buttons to the center, the rear-rank man's half on the right.

(3) They then button the halves together. The front-rank man adjusts his pole, inserts its small end through the front eyes of the tent, and holds the pole upright in position beside the bayonet. The rear-rank man pins down the front corners of the tent in line with the bayonets. He then drives the front guy pin a rifle length in front of the front pole. (See fig. 228.) If he is not armed with the rifle, he measures off, on the tent rope, the distance from the base of the front tent pole to either the right or left front tent pin and drives the front guy pin this distance in front of the front tent pole (the distance from the base of a tent pole to its corresponding corner tent pin being equal to the length of a rifle). He places the loop of the guy rope over the front guy pin, runs the other end of the rope through the loops of the shelter halves, and ties it at such length that the pole is vertical when the rope is taut. Both men of the file then proceed to the rear of their tent. The rear-rank man adjusts his pole as described above, while the front-rank man pins the tent corners, the rear guy rope, and the rear triangle so that the rear guy pin is a bayonet length in rear of the triangle. (See fig. 229.) If he is not armed with the bayonet, he drives the rear guy pin as prescribed for the front guy pin. The rear-rank man drives the remaining pins on the right and the front-rank man drives them on the left.

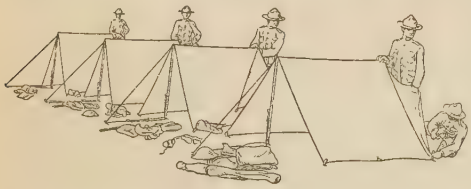

FIG. 229

FIG. 230

(4) Each man then arranges the contents of his pack as described in the Landing Force Manual (art. 5–22) and stands at attention by the side of his own shelter half, toes on line with the corner tent pins. (See fig. 230.)

18–72. Supervision.—Platoon commanders supervise their platoons throughout the exercise. They are responsible for an exact alignment of the poles and guy-rope pins.

Pitching Double Shelter Tents

18–73. Purpose.—The purpose of this exercise is to establish the unit rapidly and correctly in a double-tent camp, arranged in a neat and orderly manner. The double-tent camp is preferable to the single tent in cold or inclement weather because of the superior shelter it affords. It is valuable in restricted areas, because of its greater concentration of personnel. The double tent is composed of two single tents buttoned together at the square ends. The tent is supported by three poles, one in the center and one at each end. Two guy ropes are attached to each end. Guy pins are in line with the side pins of the tent. Nos. 1 and 2, front and rear rank, pitch and occupy one double tent; Nos. 3 and 4, front and rear rank, another.

18–74. Formation.—As for single tents, paragraph 18–69.

18–75. Commands.—*a.* **FORM FOR SHELTER TENTS.**

b. 1. **Take interval, 2 paces,** 2. **To the right (left),** 3. **MARCH,** 4. **Company,** 5. **HALT.**

c. **PITCH DOUBLE TENTS.**

18–76. Execution.—*a. Forming.*—At the command **Form for shelter tents** the exercise proceeds as for single tents, paragraph 18–71*a*.

b. Taking intervals.—At the commands for taking interval, the movement is executed as prescribed in the school of the squad, but with an interval of 2 paces.

c. Pitching.—(1) At the command **Pitch double tents** all men proceed as for single tents, paragraph 18–71*c*, except that only the odd numbers of the front rank mark the line with their bayonets. The rear-rank men do not step forward in line with the front rank. They place their packs and rifles on the ground at such convenient distance to the rear as not to interfere with pitching the tent.

(2) After the bayonets have been placed, all men spread their shelter halves on the ground to be occupied by their respective tents. Front-rank men place their shelter halves with triangles to the front; the rear-rank men place theirs with the triangles to the rear.

(3) They button together the four shelter halves of each tent, the ridges first, then the square ends. The odd numbers, front and rear ranks, insert and support the front and rear poles, respectively, the front pole in contact with the bayonet, the rear pole in a line with it perpendicular to the line of bayonets. The even numbers, front and rear ranks, pin the front and rear corners of the tent. The even number of the front rank then enters the tent with his pole and, assisted by the even number of the rear rank, adjusts the pole to the center eyes of the shelter halves. He inserts the top of the pole, in the following order, through the eyes of the lower half of the front tent, the lower half of the rear tent, the upper half of the front tent, and the upper half of the rear tent. The even numbers then fasten the guy ropes and all drive the remaining pins.

FIG. 231

(4) The occupants turn back the triangular ends, display the contents of their packs, as prescribed in the Landing Force Manual (art. 5–22), and stand at attention by the side of their own shelter halves, facing outward, with their toes on line with the corner tent pins.

To Strike Shelter Tents

18–77. The men standing in front of their tents: **STRIKE TENTS.**

Equipments and rifles are removed from the tent; the tents are lowered, packs made up, and equipments slung, and the men stand at attention in the places originally occupied after taking intervals.

Single Sleeping Bag

18–78. Spread the poncho on the ground, buttoned end at the feet, buttoned side to the left; fold the blanket once across its short dimension and lay it on the poncho, folded side along the right side of the poncho; tie the blanket together along the left side by means of the tapes provided; fold the left half of the poncho over the blanket and button it together along the side and bottom.

Double Sleeping Bag

18–79. Spread one poncho on the ground, buttoned end at the feet, buttoned side to the left; spread the blankets on top of the poncho; tie the edges of the blankets together with the tapes provided; spread a second poncho on top of the blankets, buttoned end at the feet, buttoned side to the right; button the two ponchos together along both sides and across the end.

Common and Wall Tents

18–80. To pitch all types of service tents, except shelter and conical wall tents: Mark the line of tents by driving a wall pin on the spot to be occupied by the right (or left) corner of each tent. For pyramidal tents, the interval between adjacent pins should be about 30 feet, which gives a passage of two feet between tents. If the tripod is used, spread it on the ground where the center of tent is to be. Spread the tent on the ground to be occupied, door to the front, and place the right (or left) front wall loop over the pin. The door (or doors, if more than one) being fastened and held together at the bottom, the left (or right) corner wall loop is carried to the left (or right) as far as it will go and a wall pin driven through it, the pin being placed in line with the right (or left) corner pins already driven. At the same time, the rear corner wall loops are pulled to the rear and outward, so that the rear wall of the tent is stretched to complete the rectangle. Wall pins are then driven through these loops. Each corner pin should be directly in rear of the corresponding front corner pin, forming a rectangle. Unless the canvas is wet, a small amount of slack should be allowed before the corner pins are driven. According to the size of the tent, one or two men, crawling under the tent if necessary, fit each pole or ridge or upright into the ring or ridge pole holes, and such accessories as hood, fly, and brace ropes are adjusted. If a tripod be used, an additional man goes under the tent to adjust it. The tent, steadied by the remaining men, one at each corner guy rope, is then raised. If the tent is a ward or storage type, corner poles are next placed at the four corners. The four corner guy ropes are then placed over the lower notches of the large pins which are driven in prolongation of the diagonals at such distance as to hold the walls and ends of the tent vertical and smooth when the guy ropes are drawn taut. A wall pin is then driven through each remaining wall loop, and a large pin for each guy rope is driven in line with the corner guy pins already driven. The guy ropes of the tent are placed over the lower notches of the pins, while the guy ropes of the fly are placed over the upper notches, and are then drawn taut. Brace ropes, when used, are then secured to stakes or pins suitably placed.

Conical Wall Tent

18–81. Drive the door pin and center pin, 8 feet 3 inches apart. Using the hood lines with the center pin as center, describe two concentric circles with radii, 8 feet 3 inches, and 11 feet 3 inches. In the outer circle, drive two door guy pins, 3 feet apart. At intervals of about 3 feet, drive the other guy pins.

In other respects, conical tents are erected practically as in the case of pyramidal tents.

To Strike Common, Wall, Pyramidal, and Conical Wall Tents

18–82. STRIKE TENTS.

The men first remove all pins except those of the four corner guy ropes or (conical wall tent) the four quadrant guy ropes. The pins are neatly piled or placed in a receptacle.

One man holds each guy, and when the ground is clear, the tent is lowered and folded, or rolled and tied, the poles, or the tripod and pole, fastened together, and the remaining pins collected.

To Fold Tents

18–83. In folding common, wall, hospital, and storage tents: Spread the tent flat on the ground, folded at the ridge so that bottoms of side walls are even, ends of tent forming triangles to the right and left; fold the triangular ends of the tent in toward the middle, making it rectangular in shape; fold the top over about 9 inches; fold the tent in two by carrying the top fold over clear to the foot;

fold again in two from the top to the foot; throw all guys on the tent except the second from each each end; fold the ends in so as to cover about two-thirds of the second cloths; fold the left end over to meet the turned-in edge of the right end, then fold the right end over the top, completing the bundle; tie with the two exposed guys.

Method of Folding Pyramidal Tent

18–84.—The tent is thrown toward the rear, and the back wall and roof canvas pulled out smooth. This may be most easily accomplished by leaving the rear-corner wall pins in the ground with the wall loops attached, one man at each rear-corner guy and one holding the square iron in a perpendicular position and pulling the canvas to its limit away from the former front of the tent. This leaves the three remaining sides of the tent on top of the rear side, with the door side in the middle.

Next carry the right-front corner over and lay it on the left-rear corner. Pull all canvas smooth, throw guys toward the square iron, and pull the bottom edges even. Then take the right-front corner and return to the right, covering the right-rear corner. This folds the right side of the tent on itself, with the crease in the middle and under the front side of tent.

Next carry the left-front corner to the right and back as described above; this when completed will leave the front and rear sides of the tent lying smooth and flat and the two walls folded inward, each on itself.

Place the hood in the square iron which has been folded downward toward the bottom of tent, and continue to fold around the square iron as a core, pressing all folds down flat and smooth, and parallel with the bottom of the tent. If each fold is compactly made and the canvas kept smooth, the last fold will exactly cover the lower edge of the canvas. Lay all exposed guys along the folded canvas except the two on the center width, which should be pulled out and away from bottom edge to their extreme length for tying. Then, beginning at one end fold toward the center on the first seam (the one joining the first and seconds widths), and fold again toward the center so that the already folded canvas will come to within about 3 inches of the middle width. Then fold over to the opposite edge of middle width of canvas. Then begin folding from opposite end, folding the first width in half, then making a second fold to come within about 4 or 5 inches of the part of the tent already folded, turn this fold entirely over that part. Take the exposed guys and draw them taut across each other, turn bundle over on the under guy, cross guys on top of bundle, drawing them tight. Turn bundle over on the crossed guys and tie lengthwise.

When properly tied and pressed together, the package thus made will be 11 by 23 by 34 inches, requiring about 8,855 cubic inches to store or pack.

Stencil the unit designation on the lower half of the middle width of canvas in the back wall.

Chapter 19

COMBAT

Section I.—GENERAL

19–1. These regulations deal with the principles of tactical employment of infantry units and of auxiliary arms and special units placed under the orders of infantry commanders for combat. In regard to the latter, only so much is included as relates to the tactical dispositions which infantry commanders must make to coordinate the action of attached auxiliary arms and special units with that of the infantry.

19–2. The engagement of numerically superior forces does not in itself insure victory. Discipline, leadership, skill in use of weapons and ground, and above all superior resolution are the conditions essential to success.

19–3. Modern combat demands the highest order of training, discipline, leadership, and morale on the part of the infantry. Complicated maneuvers are impracticable; efficient leadership and a determination to win by simple and direct methods must be depended upon for success.

The duties of infantry are many and difficult. All infantry must be fit to cope with all conditions that may arise. Modern war requires but one kind of infantry—good infantry.

The infantry must have the tenacity to hold every advantage gained, the individual and collective discipline and skill needed to master the enemy's fire, and the determination to close with the enemy in attack; and to meet him with the bayonet in defense. Infantry must be trained to bear the heaviest burdens and losses, both of combat and march. Good infantry can defeat an enemy greatly superior in numbers, but lacking in training, discipline, leadership, and morale.

19–4. It is impossible to establish fixed forms or to give general instructions that will cover all cases. Officers and petty officers must be so trained that they can apply suitable means and methods to each case as it arises. Study and practice are necessary to acquire proper facility in this respect. Theoretical instruction can not replace practical instruction; the former supplies correct ideas and gives to practical work an interest, purpose, and definiteness not otherwise obtainable.

After the mechanism of extended order drill has been learned with precision in the platoon, every exercise should be, as far as practicable, in the nature of a maneuver (combat exercise) against an imaginary, outlined, or represented enemy.

Platoon extended-order drill may be conducted without reference to a tactical situation, but a combat exercise, whatever may be the size of the unit employed, should be conducted under an assumed tactical situation.

19–5. An effective method of conducting a combat exercise is to outline the enemy with a few men equipped with flags. The umpire or inspector states the situation, and the commander leads his troops with due regard to the assumptions made.

Changes in the situation, the results of reconnaissance, the character of artillery fire, etc., are made known to the commander when necessary by the umpire or inspector, who, in order to observe and influence the conduct of the exercise, remains in rear of the firing line. From this position he indicates, with the aid of prearranged signals, the character of the fire and movements of the hostile infantry. The signals are intended for the men outlining the enemy. These men repeat the signals; all officers and men engaged in the exercise and in sight of the outlined enemy are thus informed of the enemy's action, and the exercise is conducted accordingly.

Assistant umpires, about one for each platoon in the first line, may assist in indicating hostile fire and movements and in observing the conduct of the exercise.

An outlined enemy may be made to attack or defend.

Situations should be simple and natural. During or after the exercise, the umpire or inspector should call attention to any improper movements or incor-

rect methods of execution. He will prohibit all movements of troops or individuals that would be impossible if the enemy were real. The slow progress of events to be expected on the battle field can hardly be simulated but the umpire or inspector will prevent undue haste and will attempt to enforce a reasonably slow rate of progress.

The same exercise should not be repeated over the same ground and under the same situation. Such repetitions lead to the adoption of a fixed mode of attack or defense and develop mere drill masters. Fixed or prearranged systems are prohibited.

Section II.—OFFENSIVE COMBAT

General Principles

19–6. The infantry must take the offensive to gain decisive results. Both sides are therefore likely to attempt it, though not necessarily at the same time or in the same part of a long battle line.

In the local combats which make up the general battle, the better endurance, use of ground, fire efficiency, discipline, and training will win. It is the duty of the infantry to win the local successes which enable the commanding general to win the battle.

19–7. An infantry that knows how to attack will know how to defend, because it is easier to defend than to attack. While training in the duties of covering detachments and in defensive measures generally will not be neglected, such training must not be emphasized at the expense of the more important combat training. All training should aim at developing positive qualities of character and action rather than encouraging negative traits. The basis of training will be the attack.

19–8. The infantry attack has as its basis the fighting spirit and aggressiveness of officers and petty officers with fearless, intelligent leading on their part, and the individual initiative of the seaman himself. It is the special duty of all leaders to stimulate and cultivate these qualities and to develop discipline and self-confidence, individual vigor, and fighting capacity, in order to establish and maintain the moral value of the infantry.

19–9. The primary duties of infantry commanders in combat are to maintain direction on their objectives, establish and maintain contact with the units on their flanks, and keep the higher command informed as to the situation. The posts of commanders and their message centers should be chosen with reference to these requirements.

Before entering an action the commander should be as far to the front as practicable, in order that he may personally see the situation, order the deployment, and begin the action strictly in accordance with his own wishes.

During the action he must as a rule leave to the local leaders the detailed conduct of the assaulting troops, posting himself either with his reserve or in such a position that he is in constant, direct, and easy communication with it.

When their troops are victorious, all commanders should press forward to clinch the advantage gained and to use their reserves to the best advantage.

19–10. There is no situation which can justify a commander for remaining in ignorance of the situation on his front. The necessity for communication with the rear must not so tie him to a fixed post as to prevent him from keeping in touch with the situation by personal reconnaissance or from exercising his direct personal influence on the troops in action. The requirements of intercommunication should be met by a properly organized report and message center which, during the absence of the commander, is under charge of an officer competent to carry into effect the orders of superior authority.

19–11. Infantry has two general methods of action: **fire** and **movement**.

Fire must be used to cover all movement in the presence of the enemy not masked by cover, darkness, or fog.

Movement has as its object the gaining of such a position relative to the enemy as will permit of the development of a fire superior to that of the enemy, either by virtue of its direction (flanking or from the rear) or its volume (enveloping action).

19–12.—The movement of units in the advance to the attack should be by **bounds**, i. e., successive positions along the axis of movement are selected as intermediate objectives and reconnoitered prior to occupation. The objects of the advance by bounds are:

(1) To preserve the direction of the advance;

(2) To gain possession of the points of the terrain which will constitute supporting points for a further advance;

(3) To locate positions affording cover and determine the most suitable routes of advance thereto.

19–13. **Surprise** is an essential element of a successful attack. In small, as well as large operations, the effect of surprise should constantly be striven for. This effect is attained by concealment of the place or time of attack, coupled with rapidity of maneuver. Concealment of the point of attack permits the offense to concentrate superior forces and gain the time required for the prosecution of a sustained offensive before its action can be countered by a hostile concentration. Concealment of the time of attack favors the moral effect which is the essence of all offensive action and prevents the defense from taking timely countermeasures.

19–14. The effect of surprise must be reinforced and exploited by **fire superiority.** The advance can dispense with fire protection only when covered by darkness, fog, or smoke.

19–15. The success of any operation undertaken by a unit depends in a large measure on the degree to which subordinate units lend each other mutual support. While for the purposes of the orderly development of an operation it is necessary to assign zones of action to units, such assignment must in no sense be construed as preventing them from operating outside the limits of such zones for the purpose of supporting the action of adjacent units when this can be done without abandoning their primary mission and the tactical situation requires it.

The principle of mutual support is of special application to units in support and reserve which have not yet been committed to action.

19–16. The critical points of a hostile defensive system are in general those points which afford extended observation, either over the defensive zone and its rear or the ground over which the attack must advance, and those points which control the communications of the defensive zone (road centers, villages). Such points are the especially important objectives of the attack.

19–17. When officers and men belonging to fighting troops leave their proper places to carry back or to care for wounded during the progress of the action, they are guilty of skulking. This offense must be repressed with the utmost vigor.

Section III.—LEADERSHIP

General Considerations

19–18. The art of leadership consists in applying sound tactical principles to concrete cases on the battle field.

Self-reliance, initiative, aggressiveness, and a conception of teamwork are the fundamental characteristics of successful leadership.

19–19. A correct grasp of the situation and a definite plan of action form the soundest basis for a successful combat.

A good plan once adopted and put into execution should not be abandoned unless it becomes clear that it can not succeed. Afterthoughts are dangerous, except as they aid in the execution of details in the original plan.

19–20. Combats that do not promise success or some real advantage to the general issue should be avoided; they cause unnecessary losses, impair the morale of one's own troops, and raise that of the enemy.

19–21. Complicated manuevers are not likely to succeed in war. All plans and the methods adopted for carrying them into effect must be simple and direct.

Order and cohesion must be maintained within the units if success is to be expected.

19–22. Officers must show themselves to be true leaders. They must act in accordance with the spirit of their orders and must require of their troops the strictest discipline on the field of battle.

19–23. The best results are obtained when leaders know the capacity and traits of those whom they command; hence in making detachments units should not be broken up, and a deployment that would cause an intermingling of the larger units in the firing line should be avoided.

19–24. Leading is difficult, when troops are deployed. A high degree of training and discipline and the use of close-order-formations to the fullest extent possible are therefore required.

19–25. In order to lighten the severe physical strain inseparable from infantry service in campaign, constant efforts must be made to spare the troops unnecessary hardships and fatigue; but when necessity arises, the limit of endurance must be exacted.

19–26. The complete equipment is carried into action unless the weather or the physical condition of the men renders such measure a severe hardship. In any event, only the pack[1] will be laid aside. The determination of this question rests with the regimental commander. The complete equipment affords to men lying prone considerable protection against shrapnel.

19–27. A commander takes full and direct charge of his firing line only when the line has absorbed his whole command.

19–28. The latitude allowed to officers is in direct proportion to the size of their commands. Each should see to the general execution of his task, leaving to the proper subordinates the supervision of details, and interfering only when mistakes are made that threaten to seriously prejudice the general plan.

Teamwork

19–29. The comparatively wide fronts of deployed units increase the difficulties of control. Subordinates must therefore be given great latitude in the execution of their tasks. The success of the whole depends largely upon how well each subordinate coordinates his work with the general plan.

A great responsibility is necessarily thrown upon subordinates, but responsibility stimulates the right kind of an officer.

19–30. In a given situation it is far better to do any intelligent thing consistent with the aggressive execution of the general plan, than to search hesitatingly for the ideal. This is the true rule of conduct for subordinates who are required to act upon their own initiative.

A subordinate who is reasonably sure that his intended action is such as would be ordered by the commander, were the latter present and in possession of the facts, has enough encouragement to go ahead confidently. He must possess the loyalty to carry out the plans of his superior and the keenness to recognize and to seize opportunities to further the general plan.

19–31. Independence must not become license. Regardless of the number of subordinates who are apparently supreme in their own restricted spheres, there is but one battle and but one supreme will to which all must conform.

Every subordinate must therefore work for the general result. He does all in his power to insure cooperation between the subdivisions under his command. He transmits important information to adjoining units or to superiors in rear, and, with the assistance of information received, keeps himself and his subordinates duly posted as to the situation.

19–32. When circumstances render it impracticable to consult the authority issuing an order, officers should not hesitate to vary from such order when it is clearly based upon an incorrect view of the situation, is impossible of execution, or has been rendered impracticable on account of changes which have occurred since its promulgation. In the application of this rule the responsibility for mistakes rests upon the subordinate, but unwillingness to assume responsibility on proper occasions is inductive of weakness.

Superiors should be careful not to censure an apparent disobedience where the act was done in the proper spirit and to advance the general plan.

19–33. When the men of two or more units intermingle in the firing line, all officers and men submit at once to the senior. Officers and platoon guides seek to fill vacancies caused by casualties. Each seizes any opportunity to exercise the functions consistent with his grade, and all assist in the maintenance of order and control.

Every lull in the action should be utilized for as complete restoration of order in the firing line as the ground or other conditions permit.

19–34. Any officer or p. o. who becomes separated from his proper unit and can not rejoin must at once place himself and his command at the disposal of the nearest higher commander.

Anyone having completed an assigned task must seek to rejoin his proper command. Failing in this, he should join the nearest troops engaged with the enemy.

19–35. Men are taught the necessity of remaining with their companies, but those who become detached must join the nearest company and serve with it until the battle is over or reorganization is ordered.

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[1] The "pack" includes blanket, poncho, clothing, and shelter tent.

Section IV.—COMBAT PRINCIPLES

19–36. Combat is divided into two general classes, the **offensive** and the **defensive.** The defensive is divided into the purely passive defense and the temporary defense, which has for its object the assumption of the offensive at the first favorable opportunity.

Decisive results are obtained only by the offensive. Aggressiveness wins battles. The purely passive defense is adopted only when the mission can be fully accomplished by this method of warfare. In all other cases, if a force be obliged by uncontrollable circumstances to adopt the defensive, it must be considered as a temporary expedient, and a change to the offensive with all or part of the forces will be made as soon as conditions warrant such change.

19–37. Irrespective of other considerations, successful operations in the field depend:

1. Upon a concrete, definite, and well-advised plan of action; and,
2. Upon a proper communication of this plan to the subordinates who must assist in carrying it out.

The first of these involves a proper estimate of the situation, having due regard to the tactical situation and the forces available and opposing; the second involves the issue of formal field orders, to adequately convey the plan to the various units concerned. The larger the forces and the greater the distribution of the command, the more necessary is it that such plan and such orders be well conceived and clearly expressed.

Plan of Action

19–38. The estimate of the situation and the resulting plan of action are based upon the information of the enemy and of the terrain obtained by reconnaissance and, as far as time will permit, upon the study of the terrain in the field of probable operations, by the leader himself. The leader then carefully considers, from his own viewpoint, all the circumstances affecting the particular problem.

In making his estimate he considers his mission as set forth in the orders or instructions under which he is acting, or as deduced by him from his knowledge of the situation, all available information of the enemy (strength, position, movements, probable intentions, etc.), conditions affecting his own command (strength, position, supporting troops, etc.), and the terrain in so far as it affects the particular military situation. He also considers the relative efficiency of the troops on both sides, and the probable results of victory or defeat. He then compares the various plans of action open to him and decides upon the one that will best enable him to accomplish his mission.

In doubtful cases aggressiveness and initiative will usually win. To take up a defensive position, to withdraw, or to change the direction of march so as to avoid contact with the enemy may be a conservative or prudent course to follow in doubtful cases, but such a course will not bring victory nor shorten the campaign. The mission of an army in war is to win battles. Every step taken must be with that end in view.

Clear and decisive orders are the logical result of definite and sure decisions and are the means of transforming the decision into action.

Combat Orders

19–39. The initial combat orders of the brigade are almost invariably written; those of the regiment are generally so. The written order is preferable and is used whenever time permits.

If time permits, subsequent orders are likewise written, either as field orders or messages.

19–40. The initial combat orders of battalions and smaller units are usually given verbally. For this purpose the subordinates for whom the orders are intended are assembled, if practicable, at a place from which the situation and plan can be explained.

Subsequent orders are verbal or in the form of verbal or written messages. Verbal messages should not be used unless they are short and unmistakable.

19–41. Usually the orders of a commander are intended for, and are given to, the commanders of the next lower units, but in an emergency a commander should not hesitate to give orders directly to any subordinate. In such case he should promptly inform the intermediate commander concerned.

19–42. (1) **The combat order** gives such information of the enemy and of neighboring or supporting friendly troops as will enable subordinates to understand the situation.

(2) The general plan of action is stated in brief terms, but enough of the commander's intentions are divulged to guide the subsequent actions of the subordinates.

(3) The commander assigns tasks, fronts, objectives, sectors or areas, etc., in accordance with the plan. If the terms employed convey definite ideas and leave no loopholes, the conduct of subordinates will generally be correspondingly satisfactory. Combat orders should prescribe communication, reconnaissance, flank protection, etc., when some special disposition is desired or when an omission on the part of a subordinate may reasonably be feared.

(4) Such miscellaneous matter relating to special troops, trains, ammunition, and future movements of the commander is added as concerns the combat itself.

19–43. Combat orders are the expression of a fixed decision and must definitely state the end in view, such as "To attack," or "To take up and defend" a position. Vague or ambiguous orders indicate vacillation and the absence of any definite decision on the part of the officer responsible for them.

Such expressions as "attempt to capture," "try to hold," "as far as possbile," "as well as you can," etc., are forbidden. They tend to divide responsibility between the commander and his subordinates.

Troops have a right to be told, in terms that are direct and unmistakable, exactly what it is their leader wants them to do.

19–44. When issuing orders, a commander should indicate clearly what is to be done by each subordinate, but not how it is to be done. He should not encroach upon the functions of a subordinate by prescribing details of execution unless he has good reason to doubt the ability or judgment of the subordinate, and can not substitute another. The order should contain everything beyond the independent authority of the subordinate, but nothing more.

19–45. When the transmission of orders involves a considerable period of time, during which the situation may change, detailed instructions are avoided. The same rule holds when orders may have to be carried out under unforseen circumstances. In such cases letters of guidance are preferable; they lay stress upon the object to be attained, and leave open the means to be employed. Orders attempting to arrange matters too far in advance may have to be recalled and others substituted; such changes impose needless hardships upon a command and injure its morale.

Details of time and place are carefully stated. Subordinate commanders and staff officers regulate their watches by the time kept at headquarters.

Orders issued by subordinates should not be mere repetitions of those from higher authority with additions of their own. New orders are generally clearer and more satisfactory.

19–46. Once committed to any line of action, change to another is costly both in men and morale. It is impossible for the higher troop leaders to directly influence the course of action once begun in any way except through the use of such reserves as may be at hand. Modern fire effect will not permit the higher leaders to change abruptly the course of action of troops already engaged by the mere sending of orders, verbal or written, to the commanders of such troops.

Framing Field Orders

19–47. The instructions of the preceding articles concerning combat orders apply also to any other variety of field orders. In framing field orders, the standard form of these orders should be adhered to where practicable.

19–48. Field orders must be clear and definite. Expressions, depending upon the view point of the observer, such as right, left, in front of, behind, on this side, beyond, etc., are avoided, reference being made to points of the compass instead. The terms "right" and "left," however, may be applied to individuals or bodies of men, or to the banks of a stream; in the latter case the observer is supposed to be facing downstream. The terms "right flank" and "left flank" are fixed designations. They apply primarily to the right and left of a command when facing the enemy and do not change when the command is retreating. The head of a column is its leading element, no matter in what direction the column is facing; the other extremity is the tail.

Field orders are brief; short sentences are easily understood; conjectures, expectations, reasons for measures adopted, and detailed instructions for a variety of possible events, do not inspire confidence, and should be avoided.

In framing field orders the integrity of tactical units is preserved whenever practicable.

19–49. To minimize the possibility of error, geographical names are written or printed in ROMAN CAPITALS; when the spelling does not conform to the pronunciation, the latter is shown phonetically in parentheses, thus: BICESTER (Bister), GILA (Heé-la).

When two or more places or features on the map have the same name they are distinguished by reference to other points.

A road is designated by connecting two or more names of places on the road with dashes, thus: LEAVENWORTH—LOWEMONT—ATCHISON road.

As a rule an affirmative form of expression is used. Such an order as "The artillery will not accompany the infantry" is defective, because the gist of the order depends upon the single word "not."

Written orders should be so distinct as to be legible even in bad light.

Forms of Complete Field Orders

19–50. The following forms used by the United States Army are given for the convenience of officers in the field and with a view of securing uniformity in the service. The sequence in paragraph 3 is not obligatory, the commander arranging the details according to his best judgment. For further forms, see Field Service Regulations, United States Army.

1. For an Advance

Field Orders [Title]
No. —. [Place]
[Reference to map used] [Date and hour]

Troops
(*a*) Independent Cavalry:
[Commander]
[Troops]
(*b*) Advance Guard:
[Commander]
[Troops]
(*c*) Main Body—in order of march:
[Commander] [1]
(*d*) Right [left] Flank Guard:
[Commander]
[Troops]
(*e*) Signal Troops:
[Commander]
[Troops]

1. [Information of enemy and of our supporting troops]
2. [Plan of commander]
3. (*a*) [Instructions for independent cavalry—place and time of departure, roads or country to be covered, special mission]
(*b*) [Instructions for advance guard—place and time of departure, or distance at which it is to precede the main body, route, special mission]
(*c*) [Instructions for main body—distance at which it is to follow the advance guard, or place and time of departure]
(*d*) [Instructions for flank guard—place and time of departure, route, special mission]
(*e*) [Instructions for signal troops—lines of information to be established, special mission]
(*x*) [Instructions for outpost—when relieved, subsequent duties]
4. [Instructions for field train—escort, distance in rear of column, or destination when different from that of main body, if disposition not previously covered in "Orders"]

[Instructions for sanitary, ammunition, supply, and engineer trains when necessary]
5. [Place of commander or where messages may be sent]

[Authentication]

[How and to whom issued]

2. For Outposts

Field Orders [Title]
No. —. [Place]
[Reference to map used] [Date and hour]

Troops
(*a*) Advance Cavalry:
[Commander]
[Troops]
(*b*) Supports: [2]
No. 1 [Commander]
[Troops]
No. 2 [Commander]
[Troops]
No. 3 [Commander]
[Troops]
(*c*) Detached Post:
[Commander]
[Troops]
(*d*) Reserve:
[Commander]
[Troops]

1. [Information of enemy and of our supporting troops]
2. [Plan of commander—to establish outpost, approximate line of resistance]
3. (*a*) [Instructions for advance cavalry—contact with enemy, roads or country to be specially watched, special mission]
(*b*) [Instructions for supports—positions they are to occupy, and sections of line of resistance which they are to hold, intrenching, etc.]
(*c*) [Instructions for detached post—position to be occupied, duties, amount of resistance]
(*d*) [In structions for reserve—location, observation of flanks, conduct in case of attack, duties of special troops]
4. [Instructions for field train if necessary]
5. [Place of commander or where messages may be sent, location of lines of information]

[Authentication]

[How and to whom issued] [3]

It is sometimes necessary to issue two outpost orders; the first, as above, containing general instructions; the second, issued after an inspection of the line, and containing more definite instructions or involving changes.

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[1] If a commander is designated for the main body, his name is inserted here.
[2] Numbered from the right.
[3] For small outposts it may be more convenient to write this order without a marginal distribution of troops.

3. For an Attack

Field Orders [Title]
No. —. [Place]
[Reference to map used] [Date and hour]
1. [Information of enemy, and of our supporting troops]
2. [Plan of commander—indicating the general plan of attack, usually to envelop a flank]
3. (*a*) [Instructions for artillery—position, first target, generally hostile artillery]
(*b*) [Instructions for holding attack [4]—commander, troops, direction, and objective]
(*c*) [Instructions for main attack—commander, troops, direction, and objective]
(*d*) [Instructions for reserve—commander, troops, position]
(*e*) [Instructions for cavalry—generally to operate on one or both flanks, or to execute some special mission]
(*f*) [Instructions for engineers—any special mission]
(*g*) [Instructions for signal troops—to establish lines of information between the commander and the main and secondary attacks, artillery, reserves, etc.]
4. [Instructions for sanitary train—location of dressing stations and stations for slightly wounded when practicable]
[Instructions for ammunition train—location of ammunition distributing stations]
[Instructions for field and supply trains, if not previously covered in orders]
5. [Place of commander or where messages may be sent] [Authentication]
[How and to whom issued]

NOTE.—In war it is not always possible to issue a complete attack order like the above, disposing of an entire command. In unexpected encounters, for instance, orders must be given as the situation develops

Communications

19–51. Communication is maintained by means of staff officers, messengers, relay systems, connecting files, visual signals, telegraph, or telephone.

19–52. Each regiment, employing its own personnel, is responsible for the maintenance of communication from the rg. c. back to the brigade and forward to the battalions. For this purpose the regiment uses the various means which may be furnished it. The staff and orderlies, regimental and battalion, are practiced in the use of these means and in messenger service. Orderlies carry signal flags.

19–53. Connection between the firing line and the bn. c. or rg. c. is practically limited to the prescribed flag, arm, and bugle signals. Other means can only be supplemental.

19–54. The artillery generally communicates with the firing line by means of its own staff officers or through an agent who accompanies some unit in or near the front. The infantry keeps him informed as to the situation and affords him any reasonable assistance. When the infantry is dependent upon the artillery for fire support, perfect coordination through this representative is of great importance.

Section V.—COMBAT RECONNAISSANCE

19–55. Combat reconnaissance is of vital importance and must not be neglected. By proper preliminary reconnaissance, deployments on wrong lines, or in a wrong direction, and surprises may generally be prevented.

19–56. Troops deployed and under fire can not change front, and thus they suffer greatly when enfiladed. Troops in close order formation may suffer heavy losses in a short time if subjected to hostile fire. In both formations troops must be protected by proper reconnaissance and warning.

19–57. The difficulty of reconnaissance increases in proportion to the measures adopted by the enemy to screen himself.

The strength of the reconnoitering party is determined by the character of the information desired and the nature of the hostile screen. In exceptional cases as much as a battalion may be necessary in order to break through the hostile screen and enable the commander or officer in charge to reconnoiter in person.

A large reconnoitering party is conducted so as to open the way for small patrols, to serve as a supporting force or rallying point for them, and to receive and transmit information. Such parties maintain signal communication with the main body if practicable.

19–58. Each separate column moving forward to deploy must reconnoiter to its front and flank and keep in touch with adjoining columns. The extent of the reconnaissance to the flank depends upon the isolation of the column.

19–59. Before an attack a reconnaissance must be made to determine the enemy's position, the location of his flanks, the character of the terrain, the

[4] The term "holding attack" as used in this form is for convenience only; it is never used in actual orders, as the vigor of an attack might be lessened if the troops knew it was "holding" only.

nature of the hostile field works, etc., in order to prevent premature deployment and the resulting fatigue and loss of time.

It will frequently be necessary to send forward a thin skirmish line in order to induce the enemy to open fire and reveal his position.

19–60. It will frequently be impossible to obtain satisfactory information until after the action has begun. The delay that may be warranted for the purpose of reconnaissance depends upon the nature of the attack and the necessity for promptness. For example, in a meeting engagement, and sometimes in a holding attack, the reconnaissance may have to be hasty and superficial, whereas in an attack against an enemy carefully prepared for defense there will generally be both time and necessity for thorough reconnaissance.

19–61. In defense, reconnaissance must be kept up to determine the enemy's line of advance, to ascertain his dispositions, to prevent his reconnaissance, etc.

Patrols or parties posted to prevent hostile reconnaissance should relieve the main body of the necessity of betraying its position by firing on small bodies of the enemy.

19–62. Reconnaissance continues throughout the action.

A firing or skirmish line can take care of its front, but its flanks are especially vulnerable to modern firearms. The moral effect of flanking fire is as great as the physical effect. Hence, combat patrols to give warning or covering detachments to give security are indispensable on exposed flanks. This is equally true in attack or defense.

19–63. The fact that mounted patrols are known to be posted in a certain direction does not relieve infantry commanders of the responsibility for reconnaissance and security.

To be surprised by an enemy at short range is an unpardonable offense.

19–64. The commander of a unit on a flank of a general line invariably provides for the necessary reconnaissance and security on that flank unless higher authority has specifically ordered it. In any event, he sends out combat patrols as needed.

Where the unit is on a flank of one section of the line and a considerable interval lies between the unit and the next section, he makes similar provision. In anticipation of the occurrence of gaps between attacking units, strong combat patrols are usually detailed by battalions and larger units prior to engagement for the purpose of maintaining tactical contact with adjacent units.

Organization commanders in the first line establish patrols to observe and report the progress or conduct of adjoining troops when these can not be seen.

Section VI.—DEPLOYMENT

19–65. Units are deployed in depth and in frontage. These two factors are mutually interdependent. Units which are required to make a slight advance are deployed in relatively slight depth and may therefore be assigned an extended frontage. On the other hand, units of whom a considerable penetration is required must be deployed in relatively great depth. As a general rule, a definite frontage is assigned to an attacking unit; from the frontage assigned, other factors such as the nature of the terrain being also considered, the unit commander should be able to deduce the depth of deployment and dispose the component parts of his command accordingly.

19–66. The depth of deployment will vary greatly along the front of an attacking force. Where the maneuver to be executed involves penetration of the hostile front, it will generally be greatest at those points that most favor the advance and least in front of points which are naturally strongest and most difficult of reduction. If the maneuver be one of envelopment, the greatest depths will exist on the flank in extension of which the envelopment is to take place; fronts which have only a holding or supporting mission, attack in relatively slight depth and great extension.

19–67. To gain decisive results, it will generally be necessary to use all the troops at some stage of the combat. But in the beginning, while the situation is uncertain, care should be taken not to engage too large a proportion of the command. In the original deployment, the strength of the reserve held out by each commander may comprise from one-sixth of two-thirds of his unit. On the other hand, do not employ too few and sacrifice them in driblets.

In addition to the necessity of holding out reserves for the purpose of meeting unexpected emergencies, the strength of reserves is controlled by the relation of depth and frontage as set forth in paragraph 19–65.

19–68. The density of the whole deployment decreases with the size of the command because the larger the command the greater the depth of deployment. Thus, a battalion acting alone may attack with two men per yard of front, but a regiment with three battalions may only double the front of one battalion.

19–69. In the deployment, companies establish the assaulting echelon each furnishing its own support. In each unit larger than a company, a reserve is held out.

The function of the support is, in principle, the reinforcement of the assaulting echelon and the protection of its flanks. Reinforcement may take place by increasing the density of the echelon or filling up gaps, or by prolongation of the echelon (enveloping action).

Reserves are primarily maneuvering bodies whose rôle is the outflanking of points of resistance developed by assaulting echelons, the continuation of the action of assaulting echelons when these become exhausted, and the taking in flank of resistances holding out in front of adjacent units.

19–70. When the deployment can be made deliberately, under the protection of troops already in position, units are conducted to predetermined places of deployment and formed for attack, usually under the cover of darkness. Silence and order in forming up are indispensable.

19–71. Troops are massed preparatory to deployment when the nature of their deployment can not be foreseen, or it is desirable to shorten the column or clear the road.

19–72. Where time does not permit of a deliberate deployment regulated in detail, large commands are ordinarily first formed into line of columns to facilitate the extension of the front prior to deploying. These columns march on assigned direction lines and take up an approach formation as soon as they enter the zone of the enemy's artillery fire. In approach formation, distances and intervals should be so regulated that no two elements can be taken under the burst of the same hostile shell.

19–73. During the approach march, systematic reconnaissance is carried out with a view to locating shelled areas. Such areas and other points such as villages, defiles, small woods, etc., likely to have been registered by hostile artillery are avoided. These considerations are more important than considerations of cover.

19–74. The approach march is conducted in a series of bounds; the column directs its march successively from one to another of a series of successive points which define the route of advance. The advance is conducted under the protection of covering detachments. Protection against low-flying airplanes is assured by assignment of machine guns to antiaircraft missions.

19–75. Where practicable, the infantry moves across country, leaving roads free for traffic.

19–76. Each subordinate commander, after receiving his order for action, should precede his command, as far as possible in order to reconnoiter the ground personally, and should prepare to issue his order promptly. Each commander of a first-line battalion should reconnoiter and locate a position under cover of which the battalion can be formed for attack and objectives assigned to companies without danger of surprise.

19–77. The premature deployment into combat formation causes unnecessary fatigue and loss of time, and may result in a faulty direction being taken. Troops once deployed make even minor changes with difficulty, and this difficulty increases with the frontage of the echelons.

19–78. In the larger units, when the original deployment is found to be in the wrong direction, it will usually be necessary to deploy reserves on the correct front and withdraw and assemble the leading echelon.

19–79. When practicable, direction lines should be maintained by compass bearings. Where landmarks only are assigned, misunderstandings will frequently arise, and units will be found attacking obliquely across the line of advance of other troops. This results in troops being crowded in some areas while other areas remain vacant.

With the proper use of the compass no difficulty will be encountered either in wooded or open country in the maintenance of proper lines of advance. Painstaking training is required for both officers and men in marching across country and through timber by compass direction.

19–80. When it is intended to fight to a decision, fire superiority is essential. To gain this, two things are necessary: A heavy fire and a fire well directed and controlled. Both of these are best obtained when the firing line is as dense as practicable, while leaving the men room for the free use of their rifles.

If the men are too widely separated, direction and control are very difficult, often impossible, and the intensity of fire is slight in proportion to the front occupied.

19–81. In an attack or stubborn defense the firing line should have a density of one man per yard of front occupied.

Where the tactical situation demands the holding of a line too long to be occupied throughout at this density, it is generally better to deploy companies or platoons at one man per yard, leaving gaps in the line between them, than to distribute the men uniformly at increased intervals.

19–82. A relatively thin firing line may be employed when merely covering the movements of other forces; when on the defensive against poor troops; when the final action to be taken has not yet been determined; and, in general, when fire superiority is not necessary.

19–83. The length of the firing line that the whole force may employ depends upon the density of the line and the **strength in rear** required by the situation.

Supports and reserves constitute the strength in rear.

In a decisive attack they should be at least strong enough to replace a heavy loss in the original firing line and to increase the charging line to a density of at least one and one-half men per yard and still have troops in rear for protection and for the other purposes mentioned above.

19–84. A small force in a covering or delaying action requires very little strength in rear, while a large force fighting a decisive battle requires much. Therefore, depending upon circumstances, the original deployment, including the strength in rear, may vary from 1 to 10 men per yard. Against an enemy poorly disciplined and trained, or lacking in morale, a thinner deployment is permissible.

19–85. The general deployment for a long line of battle comprising several battle districts is not directly considered in these regulations. The deployments treated of herein are those of the infantry within such districts.

The density of deployment in these districts may vary greatly, depending upon the activity expected in each. Within these battle districts, as well as in smaller forces acting alone, parts of the line temporarily of less importance may be held weakly, in order to economize troops and to have more at the decisive point.

19–86. The front that a unit may occupy when deployed depends also upon whether its flanks are secured. If both flanks are secured by other troops, the unit may increase its front materially by reducing its reserve or supports. If only one flank is so secured, the front may still be somewhat increased, but the exposed flank must be guarded by posting the supports or reserve toward that flank.

Natural obstacles that secure the flanks have practically the same effect upon deployment.

19–87. Except when assigned as supports or reserve, regiments in the brigade battalions in the regiment, and companies in the battalion are, when practicable deployed side by side.

19–88. In the deployment, battalions establish the firing line, each furnishing its own support.

In each unit larger than the battalion a reserve is held out, its strength depending upon circumstances. In general, the reserve is employed by the commander to meet or improve conditions brought about by the action of the firing line. It must not be too weak or too split up. It must be posted where the commander qelieves it will be needed for decisive action, or where he desires to bring about such action. When necessary, parts of it reinforce or prolong the firing line.

Deployment for Attack

19–89. Where open terrain exposes troops to hostile artillery fire it may be necessary to make the deployment 2 miles or more from the hostile position.

The foreground should be temporarily occupied by covering troops. If the enemy occupies the foreground with detachments, the covering troops must drive them back.

To enable large forces to gain ground toward the enemy, it may sometimes be cheaper and quicker in the end to move well forward and to deploy at night. In such case the area in which the deployment is to be made should, if practicable, be occupied by covering troops before dark.

The deployment will be made with great difficulty unless the ground has been studied by daylight. The deployment gains little unless it establishes the firing line well within the effective range of the enemy's main position. (See Night Operations, Art. 21–1 et seq.)

19-90. Each unit assigned a task deploys when on its direction line, or opposite its objective, and when it has no longer sufficient cover for advancing in close order. In the firing line, intervals of 25 to 50 yards should be maintained as long as possible between battalions. In the larger units it may be necessary to indicate on the map the direction or objective, but to battalion commanders it should be pointed out on the ground.

19-91. The reserve is kept near enough to the firing line to be on hand at the decisive stage. It is posted with reference to the attack, or to that part of the attacking line, from which the greater results are expected; it is also charged with flank protection, but should be kept intact.

Section VII.—ADVANCING THE ATTACK

19-92. Where troops are not in contact with the enemy prior to the attack, the assaulting echelon must ordinarily advance a long distance before it is justified in opening fire. It can not combat the enemy's artillery, and it is at a disadvantage if it combats the defender's long-range rifle and machine-gun fire. Hence it ignores both, and by taking full advantage of cover and of the discipline of the troops, advances to a first firing position at the shortest range possible.

19-93. At long range, the best protection of advancing troops against loss consists in their own movement and the utilization of cover from view. It should be impressed on all ranks that cover alone does not diminish losses, but that their best protection consists in the most rapid possible advance to a point where they can make most effective use of their own weapons. By clinging to cover and opening fire at long range, they play into the enemy's hands by engaging in a fire fight in which they are at a relative disadvantage, and, moreover, constitute a stationary target upon which his artillery can easily range.

It will sometimes be necessary to cross fire-swept zones by the advance of individuals who work their way forward separately and re-form on a designated position.

19-94. It will frequently become necessary for infantry moving to the attack to pass through deployed artillery. This should be done so as to interfere as little as possible with the latter's fire, and never so as to cause that fire to cease entirely. As far as practicable, advantage should be taken of intervals in the line. An understanding between artillery and infantry commanders should be had, so as to effect the movement to the best advantage.

The Fire Attack

19-95. When the effectiveness of hostile fire makes it impossible for the assaulting troops to progress without opening fire, they must continue their advance under the protection of their own fire, the fire of artillery and machine guns, and that of the accompanying weapons.

19-96. At the first firing position, attacking units seek to gain fire superiority over the opposing resistances. This may necessitate a steady, accurate fire for a long time. The object is to subdue the enemy's fire and keep it subdued so that the attacking troops may advance from this point to a favorable place near the enemy from which the assault may be delivered.

19-97. Assaulting units advance from one cover or firing position to another by successive rushes, the movement of advancing fractions being covered by the fire of those remaining in position. Diminution of the enemy's fire and a pronounced loss in effectiveness are the surest signs that fire superiority has been gained and that a part of the attacking group can advance. Enough rifles must be continued in action to keep down the enemy's fire; this determines the size of the fraction rushing.

19-98. Every lull in hostile fire is utilized to push groups to the front and occupy the natural strong points of the terrain from which covering fire, particularly that of automatic rifles, can be delivered to facilitate the further progress of the assaulting units.

19-99. The attack will not generally encounter a uniformly held, continuous line of defense. It will have to overcome a defense disposed in depth and a series of centers of resistance or strong points covering the main routes of advance, with relatively lightly held intervening intervals. By a stubborn defense of these strong points, the defense will seek to limit the penetrating action of the attack and overwhelm by counterattack the assaulting elements which succeed in penetrating its front.

There will consequently be inequality in the resistance encountered on the front of attack. Certain units of considerable size will be held up in front of the stronger centers of resistance. Others, which encounter only minor resistances, press forward as rapidly as possible without regard to the progress of units on their flanks and attempt to outflank the main hostile resistances. The battle thus becomes a series of local combats carried on by units of varying importance. The combat is not carried on by continuous lines, but by groups disposed in depth and capable of acting in any direction.

19–100. Sections of the assaulting echelon held up are not reinforced when the resistance in their front can be outflanked. By their own fire and that of the accompanying weapons, they attempt to neutralize or mask the opposing resistances and prevent them from enfilading the attacking elements advancing on their flanks.

19–101. In principle, assaulting units endeavor to obtain superiority of fire over the defensive elements into which the hostile dispositions are broken up, by enveloping action. While the assaulting echelon seeks to approach as closely as possible to the hostile position and immobilize the enemy with its fire and that of the accompanying weapons and machine guns, additional forces are brought up on the flanks to envelope the enemy or gain his rear.

The advantage of the enveloping action consists in the longer line with consequent superiority in the number of weapons in action and in convergent fire as opposed to the enemy's divergent fire. In many cases, however, the mutual flanking of hostile centers of resistance will be unfavorable to enveloping action. In such case frontal attack will be necessary.

19–102. Where the opposing resistance consists of isolated machine-gun nests, the precision of the accompanying weapons at close range is often sufficient to put the enemy out of action. In any event, their fire will cover the advance of the infantry to close range and prepare for its assault. They may also be used to assist the infantry to outflank points of resistance by neutralizing the flank toward the infantry. In some cases this neutralization may be effected by the use of smoke barrages.

19–103. It is the special duty of supports and reserves during the advance to take timely measures in anticipation of hostile counterattack. They utilize all lulls in the action to occupy the natural strong points of the terrain and dispose machine guns and accompanying weapons so as to check any hostile reaction.

19–104. The deep disposition of attacking units does not imply a passive following of the assaulting echelon by supports and reserves. On the contrary, one of the purposes of the disposition in depth is to enable the attacking units to act in any direction. Commanders of supports and reserves must keep in touch with the situation on their front and flanks by constant reconnaissance and be ready to act on their own initiative in the execution of the various missions which the situation may impose. These missions may involve the protection of the flanks of neighboring units by the attacking of counterattacking hostile forces; wheeling into an adjacent sector for the purpose of taking in flank hostile resistances still holding out; covering gaps which may arise between adjacent assaulting units. For supports and reserves no less than for assaulting units there is no reason for continued inaction on the battle field.

19–105. Supports and reserves are in principle put into action where least losses are being suffered rather than where they are greatest. All commanders must endeavor to locate the points where the enemy is offering least resistance in order to exploit any weakness he may develop by the use of troops in rearward echelons.

Fire Superiority

PURPOSE AND NATURE

19–106. In a decisive battle success depends on gaining and maintaining fire superiority. Every effort must be made to gain it early and then keep it.

Attacking troops first must gain fire superiority in order to reach the hostile position. Over open ground attack is possible only when the attacking force has a decided fire superiority. With such superiority the attack is not only possible but success is probable and without ruinous losses.

Defending troops can prevent a charge only when they can master the enemy's fire and inflict heavy losses upon him.

19–107. To obtain fire superiority it is necessary to produce a heavy volume of accurate fire. Every increase in the effectiveness of the fire means a corresponding decrease in the effectiveness of the enemy's fire.

The volume and accuracy of fire will depend upon several considerations:

(*a*) **The number of rifles employed.**—On a given front the greatest volume of fire is produced by a firing line having only sufficient intervals between men to permit the free use of their rifles. The maximum density of a firing line is therefore about one man per yard of front.

(*b*) **The rate** of fire affects its volume; an excessive rate reduces its accuracy.

(*c*) **The character of the target** influences both volume and accuracy. Larger dimensions, greater visibility, and shorter range increase the rate of fire; greater density increases the effect.

(*d*) **Training and discipline** have an important bearing on the rate or volume of fire, but their greatest influence is upon accuracy.

The firing efficiency of troops is reduced by fatigue and adverse psychological influences.

(*e*) **Fire direction and control** improve collective accuracy. The importance of fire direction increases rapidly with the range. Control exerts a powerful influence at all ranges.

Fire Direction and Control

OPENING FIRE

19–108. Beyond effective ranges important results can be expected only when the target is large and distinct and much ammunition is used.

Long-range fire is permissible in pursuit on account of the moral effect of any fire under the circumstances. At other times such fire is of doubtful value.

19–109. In attack, the desire to open fire when losses are first felt must be repressed. Considerations of time, target, ammunition, and morale make it imperative that the attack withhold its fire and press forward to a first firing position close to the enemy. The attacker's target will be smaller and fainter than the one he presents to the enemy.

19–110. In defense, more ammunition is available, ranges are more easily determined, and the enemy usually presents a larger target. The defender may therefore open fire and expect results at longer ranges than the attacker, and particularly if the defenders intend a delaying action only.

If the enemy has a powerful artillery, it will often be best for the defending infantry to withhold its fire until the enemy offers a specially favorable target. Vigorous and well-directed bursts of fire are then employed. The troops should therefore be given as much artificial protection as time and means permit, and at an agreed signal expose themselves as much as necessary and open fire.

19–111. In unexpected, close encounters a great advantage accrues to the side which first opens rapid and accurate fire with battle sight.

USE OF GROUND

19–112. The position of the firers must afford a suitable field of fire. The ground should permit constant observation of the enemy, and yet enable the men to secure some cover when not actually firing.

Troops whose target is for the moment hidden by unfavorable ground, either move forward to better ground or seek to execute cross fire on another target.

19–113. The likelihood of a target being hit depends to a great extent upon its visibility. By skillful use of ground, a firing line may reduce its visibility without loss of fire power. Sky lines are particularly to be avoided.

CHOICE OF TARGET

19–114. The target chosen should be the hostile troops most dangerous to the firers. These will usually be the nearest hostile infantry. When no target is specially dangerous, that one should be chosen which promises the most hits.

19–115. Frequent changes of target impair the fire effect. Random changes to small unimportant targets impair fire discipline and accomplish nothing. Attention should be confined to the main target until substantial reason for change is apparent.

19–116. An opportunity to deliver flanking fire, especially against artillery protected in front by shields, is an example warranting change of target and should never be overlooked. Such fire demoralizes the troops subjected to it, even if the losses inflicted are small. In this manner a relatively small number of rifles can produce important results.

THE RANGE

19–117. Beyond close range, the correct setting of the rear sight is of primary importance, provided the troops are trained and well in hand. The necessity for correct sight setting increases rapidly with the range. Its importance decreases as the quality of the troops decrease, for the error in sight setting, except possibly at very long ranges, becomes unimportant when compared with the error in holding and aiming.

19–118. In attack, distances must usually be estimated and corrections made as errors are observed. Mechanical range finders and ranging volleys are practicable at times.

In defense, it is generally practicable to measure more accurately the distances to visible objects and to keep a record of them for future use.

DISTRIBUTION OF FIRE AND TARGET

19–119. The purpose of fire superiority is to get hits whenever possible, but at all events to keep down the enemy's fire and render it harmless. To accomplish this, the target must be covered with fire throughout its whole extent. Troops who are not fired upon will fire with nearly peace-time accuracy.

The target is roughly divided and a part is assigned to each unit. No part of the target is neglected. In attack, by a system of overlapping in assigning targets to platoons, the entire hostile line can be kept under fire even during a rush.

OBSERVATION

19–120. The correctness of the sight setting and the distribution of fire over the target can be verified only by careful observation of the target, the adjacent ground, and the effect upon the enemy.

19–121. Observation only can determine whether the fire fight is being properly conducted. If the enemy's fire is losing in accuracy and effect, the observer realizes that his side is gaining superiority. If the enemy's fire remains or becomes effective and persistent, he realizes that corrective measures are necessary to increase either their volume or accuracy, or both.

DISCIPLINE

19–122. Discipline makes good direction and control possible and is the distinguishing mark of trained troops.

19–123. The discipline necessary in the firing line will be absent unless officers and petty officers can make their will known to the men. In the company, therefore, communication must be by simple signals which, in the roar of musketry, will attract the attention and convey the correct meaning.

EXPENDITURE OF AMMUNITION

19–124. In attack the supply is more limited than in defense. Better judgment must be exercised in expenditure. Ordinarily, troops in the firing line of an attack can not expect to have that day more ammunition than they carry into the combat, except such additions as come from the distribution of ammunition of dead and wounded and the surplus brought by reinforcements.

19–125. When a certain fire effect is required, the necessary ammunition must be expended without hesitation. Several hours of firing may be necessary to gain fire superiority. True economy can be practiced only by closing on the enemy before first opening fire, and thereafter suspending fire when there is nothing to shoot at.

SUPPORTING ARTILLERY

19–126. Artillery fire is the principal aid to the infantry in gaining and keeping fire superiority, not only by its hits, but by the moral effect it produces on the enemy (see art. 12–282 et seq.).

19–127. In attack, artillery assists the forward movement of the infantry. It keeps down the fire of the hostile artillery and seeks to neutralize the hostile infantry by inflicting losses upon it, destroying its morale, driving it to cover, and preventing it from using its weapons effectively.

As soon as the decision to assault is made, all the fire that can be brought to bear by artillery, machine guns, fire of position, and from other parts of the

firing line will be directed upon that part of the enemy's lines selected for assault. The artillery must support this assault to the end, regardless of the losses it may sustain, and must continue its fire up to the moment of the charge, even at the risk of some of its projectiles striking among its own infantry.

In defense, artillery ignores the hostile artillery when the enemy's attack reaches a decisive stage and assists in checking the attack, joining its fire power to that of the defending infantry.

19–128. Troops should be accustomed to being fired over by friendly artillery and impressed with the fact that the artillery should continue firing upon the enemy until the last possible moment. The few casualties resulting from shrapnel bursting short are trifling compared with those that would result from the increased effectiveness of the enemy's infantry fire were the friendly artillery to cease firing.

Casualties inflicted by supporting artillery are not probable until the opposing infantry lines are less than 200 yards apart.

19–129. When the distance between the hostile infantry lines becomes so short as to render further use of friendly artillery inadvisable, the commander of the infantry firing line, using a preconcerted signal, informs the artillery commander. The latter usually increases the range in order to impede the strengthening of the enemy's foremost line.

FIRE OF POSITION

19–130. Infantry is said to execute fire of position when it is posted so as to assist an attack by firing over the heads, or off the flank, of the attacking troops and is not itself to engage in the advance; or when, in defense, it is similarly posted to augment the fire of the main firing line.

Machine guns serve a like purpose.

In a decisive action, fire of position should be employed whenever the terrain permits and reserve infantry is available.

Section VIII.—THE ASSAULT

19–131. Except where the opposing troops have been in contact for a considerable time, the assault can not generally be conducted on an extended front. Inequality of the resistance and the necessity of immediately taking advantage of weakening in the hostile resistance, wherever it occurs, will produce local assaults executed by small units and combat groups. The assault should be delivered by each unit at the earliest moment that promises success.

19–132. Where the assault is prepared by the fire of artillery, machine guns, and accompanying weapons, their fire ceases or is lifted off the objective, either at a prearranged hour or by preconcerted signal (rocket).

19–133. Fire superiority beats down the enemy's fire, destroys his resistance and morale, and enables the attacking troops to close on him, but an actual or threatened occupation of his position is needed to drive him out and defeat him.

The psychological moment for the charge can not be determined far in advance. The tactical instinct of the responsible officer must decide.

19–134. The defenders, if subjugated by the fire attack, will frequently leave before the charge begins. On the other hand, it may be necessary to carry the fire attack close to the position and follow it up with a short dash and a bayonet combat. Hence, the distance over which the charge may be made will vary between wide limits. It may be from 25 to 400 yards.

The charge should be made at the earliest moment that promises success; otherwise the full advantage of victory will be lost.

19–135. The commander of the attacking line should indicate his approval, or give the order, before the charge is made. Subordinate commanders, usually battalion commanders, whose troops are ready to charge signal that fact to the commander.

At the signal for the charge the firing line and near-by supports and reserves rush forward.

The charge is made simultaneously, if possible, by all the units participating therein, but once committed to the assault battalions should be pushed with the utmost vigor, and no restraint placed on the ardor of charging troops except to maintain alignment.

19–136. Before ordering the charge, the commander should see that enough troops are on hand to make it a success. Local reserves joining the firing line in time to participate in the charge give it a strong impetus. Too dense a mass should be avoided.

19–137. The line should be strengthened by prolongation, if practicable, and remaining troops kept in formation for future use; but rather than that the attack should fail, the last-formed body will be sent in, unless it is very apparent that it can do no good.

19–138. To arrive in the hostile position with a very compact firing line and a few formed supports is sufficient for a victory, but an additional force kept well in hand for pursuit is of inestimable value.

19–139. A premature charge by a part of the line should be avoided, but if begun, the other parts of the line should join at once if there is any prospect of success. Under exceptional conditions a part of the line may be compelled to charge without authority from the rear. The intention to do so should be signaled to the rear.

19–140. Confidence in their ability to use the bayonet gives the assaulting troops the promise of success.

19–141. After a successful assault, the situation will determine whether to follow up the enemy in pursuit or organize the position for defense against counterattack. Rapid fire should be opened on the retreating enemy if he is in sight. It is not generally advisable for units mixed and disorganized by the assault to follow the enemy. The pursuit should be immediately undertaken by the nearest organized echelons, and the assaulting troops reorganized and placed in support.

19–142. If the assault fails, the assaulting troops must dig in and hold their ground. To attempt to withdraw would result in annihilation. If the assault is to be repeated, fresh troops must be sent in as reinforcements, and the fire preparation for the assault renewed.

19–143. Where the attack succeeds in penetrating through the defensive position on a broad front, the infantry must be organized in still greater depth. Column of march is resumed as soon as the range of hostile guns permits, security detachments are sent out, and the cavalry maintains contact.

Should mounted troops or aviators discover hostile guns within range, infantry must take up an approach formation and make ready to reconnoiter and attack.

Pursuit

19–144. To reap the full fruits of victory a vigorous pursuit must be made. The natural inclination to be satisfied with a successful charge must be overcome. The enemy must be allowed no more time to reorganize than is positively unavoidable.

19–145. The part of the reserve that is still formed or is best under control is sent forward in pursuit and vigorously attacks the enemy's main body or covering detachments wherever found.

The artillery delivers a heavy fire upon the retreating enemy; the disordered attacking troops secure the position, promptly re-form, and become a new reserve.

19–146. If the captured position is a section of the general line, the breach should be heavily occupied, made wider, and strongly secured by drawing on all reserves in the vicinity.

19–147. After the pursuit from the immediate battle field, pursuit by parallel roads is especially effective where large commands are concerned.

Artillery and cavalry are very effective in pursuit.

Section IX.—POSITION WARFARE

19–148. The attack of a carefully prepared trench system is characterized by a powerful artillery preparation and the simultaneous launching in assault at a prescribed hour of large masses of infantry, widely deployed and organized in depth, the assaulting waves being preceded by a rolling barrage. For an attack of this kind, all action is regulated down to the minutest details of time and space by superior authority. The action of all forces that take part in the attack proceeds according to prearranged schedule. The initiative of subordinates is reduced to a minimum. The essentials for success are reconnaissance to determine the precise location and nature of the enemy's defenses and the resistance to overcome, systematic organization for the particular end in view, and methodical execution. The infantry overcomes the enemy by the mere fact of advancing.

An engagement of this kind is not the end but merely the means to an end. It has for its purpose the forcing of the enemy into the open where his masses may be decisively attacked and destroyed.

19–149. Having determined the location, composition, strength, and disposition of the forces of the defense, the offense selects the point and direction for attack. On a large front it may be made against a section which is generally poorly organized, weakly held, with a few reserves, etc., which invites capture. It is generally greatly influenced by strategical considerations. Locally the point and direction of attack is governed by tactical considerations. The main attacks may be made against weak points of the position or up valleys or ravines under cover of fog or smoke, with a view to penetrating the position and taking strong points from the flanks or rear.

19–150. In order that the attacking troops may close with the enemy, they must gain fire superiority over the defense. The offense attempts to gain fire superiority.

(*a*) By a preparatory bombardment which has as its object the destruction or neutralization of important elements of the defense, and the opening of lanes of advance for the infantry in the hostile accessory defenses. The fire of artillery, trench mortars, and machine guns is directed against important elements of the defense (obstacles, machine-gun emplacements, artillery emplacements, points of resistance, observation posts, command posts, dugouts, routes of communication, etc.). A long bombardment of several days' duration is destructive of the effect of surprise which is necessary to the success of the attack. Such a bombardment will, moreover, never succeed in effecting a complete destruction of the enemy's defenses. The artillery preparation should therefore be limited to the extent necessary to destroy or neutralize the more important features of the hostile defense and to paralyze the action of the defending forces, with a view to exploiting the enemy's weakness by the immediate action of the infantry.

(*b*) During the advance to the attack, by artillery, light mortar, and one-pounder bombardment directed against elements of the defense which have been located or suspected, and by a timed artillery and machine-gun barrage which the infantry may follow at a distance of about 100 yards. This is supplemented by machine guns, light mortars, one-pounders, automatic rifles, rifles, and by artillery using indirect or direct fire, which supports or accompany the infantry and direct their fire against points of resistance which still hold out. Sections of the advance held up add their automatic rifle and rifle fire to the above and support the advance of the remainder. (Tanks may be employed to reinforce this fire and support the infantry if operating with the army.)

19–151. Protected by such natural and artificial features of the ground as may be found, and by the fire mentioned in paragraph 19–150(*b*), these various echelons advance to the attack in successive waves. Each wave of the assaulting battalion usually has a strength of about one man per five yards of front; under cover of darkness or fog, this density may be increased. When sections of the advance wave are held up, they are not reinforced for a frontal attack, but together with light mortars, machine guns, one-pounders, and artillery, they attempt to gain fire superiority over the points of resistance of the defense and hold down their fire. The remaining sections of the advance waves and the supports and reserves of the attack, closely following the barrage (if there be one), attempt to penetrate the position of the defense and attack the points of resistance on the flanks and rear. The infantry of the attack is thus placed not only within assaulting distance on the front of points of resistance, but also on their flanks and rear. The fight then becomes an infantry combat supported by light mortars, one-pounders, and machine guns. Artillery support for a time is more or less uncertain.

19–152. The assault is executed by units disposed in depth. The various successive lines have taken the name "waves," but this term does not imply a uniform formation. The wave is not a rigid line advancing directly forward. Waves are formed by placing elements abreast, either in line of skirmishers or in ine of small columns. These elements are thus well controlled and flexible, and are always capable of being handled at the will of the commander. The assault formation must be accommodated to the terrain and to the hostile dispositions. It is not desirable to lay down hard and fast rules as to the formations to be adopted in an attack.

19–153. The general attack, after the breach of a systematically defended position, splits up into a series of separate combats. Unlike the trench-to-trench attack, the details of this phase of the action can not be fixed in advance. The course of events is sure to be other than what can be foreseen, and under these circumstances, if details have been prescribed in advance, subordinate commanders will be in doubt as to whether they should strive to carry out the original plan or whether they should act on their own initiative. Freedom of action and the satisfaction engendered by responsibility will be lacking.

These separate combats must be directed by brigade and subordinate commanders within the zones of action assigned them and with the means at their disposal. Fresh hostile resistance must be quickly overrun and the enemy prevented from withdrawing his guns and reestablishing his infantry in a new position. Firm control of the troops, coordinated effort within the units, and energetic leading are necessary for a sustained progression. The extent of the success will be measured by the initiative and boldness of the subordinate commanders and their capacity for quick adaptation to the changing conditions of combat and terrain.

19–154. The combat phase which follows the breach of a fortified position is characterized by the attack of hostile machine-gun nests and strong points usually echeloned in depth and disposed so as to flank the intervening intervals.

The reduction of these points and the further progress of the advance takes place in accordance with the general principles of the attack as set forth in preceding paragraphs of these regulations.

19–155. After cessation of, or loss of contact with, the creeping barrage, the advance of the attacking waves is covered by scouts. Their mission is to compel the hostile machine-gun nests to open fire and thus disclose their location.

Holding Attack

19–156. This, as the name implies, is for the purpose of holding the enemy to his position by offensive action in one part of the field while a decisive blow in the nature of an assault or of an enveloping or a turning movement is struck in another quarter. The governing idea of the holding attack is to make it energetic enough to deceive the enemy, in order that he may use as many of his troops as possible in resisting it, even drawing upon his reserves for such purpose. Early development of the maximum volume of rifle and artillery fire is therefore essential, and for that reason the deployment is on extended lines. Supports and reserves are reduced to the minimum that will be needed to replace losses, secure the flanks, and strengthen those parts of the line against which the enemy might act most aggressively. Holding attacks differ from delaying actions, in that the guiding principle in the former is offense and in the latter defense. The holding force may be called upon to push the attack to the point of an assault, and in the end will join in the advance to the enemy's position when the decisive attack has succeeded. Care must be taken that the holding attack does not, because of promising conditions in its front, make a premature assault on the enemy's line and be defeated before the decisive blow can be struck in another part of the field. There is danger, also, in prematurely pushing this attack so far that its weakness or its intentions may be disclosed to the enemy and give him the opportunity to defeat the entire force in detail.

Section X.—THE PLATOON

The conduct of the squad, section, platoon, and company in approach, deployment, and action, as well as larger commands, are very minutely covered in the Army Combat Principles, Part III.

Part III also contains the Combat Principles of the machine-gun section, platoon and company.

The principles in this chapter are more or less general and should be read before studying the more complete Army Combat Principles.

19–157. The platoon is the smallest infantry unit which is habitually deployed in depth and endowed with independent power of maneuver. It is the largest unit admitting of direct personal leadership and fire control in combat. It comprises two sections, each under a leader who, in principle, exercises direct control over his unit in all phases of battle.

19–158. The combat can not, however, always be carried to a finish by the original units. Temporary groups will frequently result from the incidents of the fight or the conditions of the terrain. Whenever temporary groups arise, each group, even though composed of a handful of men, must have a leader. This leader, whether he be a petty officer or seaman must rise spontaneously to direct his comrades, carry them forward when they hesitate, and prevent them from giving ground. Temporary groups deploy, advance, and fire in the same way as normal units. All that is stated below with reference to the section applies equally to the group, whatever its strength.

19–159. Before the engagement, it is imperative that the company commander designate men to replace the leaders of platoons, sections, and squads in case of casualties, so that the assumption of command will be automatic.

Leaders

19–160. The platoon is commanded by a leader, aided by the platoon first petty officer. The platoon 1st p. o. replaces the platoon leader when the latter becomes a casualty.

19–161. The platoon leader commands his platoon by means of commands and signals. He is at all times responsible for the maintenance of the direction of march of his platoon and for connection with the base platoon. The integrity of the platoon is preserved by observance of the direction assigned and by maintenance of connection with the base squad.

In the advance to the attack, the platoon leader, accompanied by his runners, is sufficiently in advance of his platoon to make the reconnaissance necessary for the proper leading of his platoon. During the fire fight, his position is at the head or in the center of his platoon. He is not bound to any fixed post.

When the platoon is deployed in two waves, it is the special duty of the platoon 1st p. o. to maintain connection between the platoon leader and his second wave, to prevent the second wave from becoming prematurely merged in the leading wave and to direct the engagement of the second wave when so instructed by the platoon leader or when the situation requires it.

19–162. The section leader guides his unit. He looks at it only when his exercise of control demands it—his eyes should be fastened on the enemy. The section must be bound to its leader, who, under all circumstances, is the rallying point. His bearing and his pace sets the standard for the unit.

19–163. At short ranges, the platoon and section leaders abstain from useless gestures, which might disclose their location to the enemy.

19–164. The squad leaders maintain the positions assigned them and see that the platoon and section leaders' orders are executed. They transmit the commands and signals when necessary, observe the conduct of their squads, and assist in enforcing fire discipline. When the ability of platoon and section leaders to control the action of their units ceases, squad leaders lead their squads on their own initiative, lending each other mutual support.

General Principles of Attack

19–165. In either position or open warfare, the tactics of the platoon in attack resolve themselves in the majority of cases into the method of attack of tactical points. A tactical point may be described as a locality, the possession of which is of the first importance locally to either side. It may take the form of any of the following: "A strong point," a piece of ground furnishing an advantageous fire position or good observation, a bank, a hedge, a house, or any locality of limited dimensions.

The tactics to be employed may be summarized as follows:

(1) Push on to the objective with the fixed determination of getting in with the bayonet as soon as possible.

(2) If held up by a hostile resistance, open as heavy a fire as possible with a view to immobilizing the enemy and facilitating an envelopment of the resistance. Bring up units from the second wave on one or both flanks of the first wave under the protection of its fire. Movements under covering fire, especially that of rifle grenades the stock of which is limited, must be as rapid as possible. If possible, use automatic rifles to open flanking fire as soon as the best way of employing them has been determined by reconnaissance.

(3) If it is impossible, on account of flanking fire from other hostile localities situated to the flank and rear, to reduce the hostile strong point by enveloping action, prepare for a frontal attack. The aim should be to produce as large a volume of frontal and oblique fire as possible and under its protection to build up an assaulting line at close range to the hostile resistance.

(4) Opportunities to advance are often transient. Take immediate advantage of effective fire of artillery, accompanying weapons, and machine guns, or the flanking fire of adjacent platoons, to make a rush.

(5) Reinforcing a platoon which is held up does not necessarily mean thickening the line; assistance may often be more effectively given from a flank. It is always the duty of the leader to acquaint himself with the situation by personal reconnaissance before committing his platoon to any line of action.

(6) Cooperate and keep in touch with the platoons on either flank, and be on the lookout to assist them. The circumstances of the situation will determine whether this can best be done by delivering flanking fire across their front or by continuing the advance. When it is possible to outflank the hostile resistance, assistance may often be more effectively rendered by pushing ahead than by

directly supporting a platoon held up; the surest means of helping a neighbor in battle is to push on.

19–166. The rôle of the platoon and section leaders consists in combining fire with movement. The advance is made in one body if under cover, at quick time; if in the open and exposed to fire by smaller elements employing short rushes at full speed. These can also advance by filtering over ground furnishing but little cover.

19–167. More attacks fail from loss of direction than from any other cause. Every platoon leader must practice himself and his section leaders in the use of the compass, selecting points such as a tree or other conspicuous object as a direction point and reconnoitering before movement whenever possible. Platoons must be practiced in crossing long stretches of ground without losing the direction of march or connection with adjacent units.

Advancing the Attack

19–168. When closely following a moving barrage, there is seldom room for scouts. When the barrage has been lost or does not exist, as is ordinarily the case in the open field, scouts should precede the assaulting platoons. They should deploy in pairs at wide and irregular intervals, 10 to 50 yards, to present a poor target to hostile infantry and machine guns. They should take every possible advantage of the ground to obtain cover, provided their advance is not thereby unduly delayed, and cross exposed ground at a run. Their distance in front of the main bodies of their platoons follows no set rule but constantly varies with the ground and with the position of the enemy. One moment, they may be 500 yards ahead of their platoons; a few minutes later, they may be absorbed therein. Their purpose is to compel the enemy infantry and machine guns to open fire and so disclose their location. When the hostile machine guns or strong points have been located, the scouts should at once open fire. In each pair, one scout covers the advance of the other with his rifle.

19–169. The platoon, following the scouts, crosses open stretches at a run by successive rushes. Fire-swept areas may be crossed by the successive advance of individuals at widely separated intervals who work their way forward and re-form on a designated terrain line in advance.

The Fire Attack

19–170. Under cover of the fire of the scouts, enough men from the platoon work forward individually or in small groups to the thin and irregular line of scouts in order to give it sufficient fire power to pin the enemy to the ground. If the scouts are in low ground, it will sometimes be advisable for the platoon to open fire over their heads from commanding ground in rear. But the firing line, however formed, must remain a thin one, with no two men ever less than five paces apart, and in the usual case preferably at much greater intervals. The first reenforcements for the scouts should contain one or more automatic rifle teams. At the same time, units of the second wave begin to work around one or both flanks of the first wave to get at the flanks of the strong point and thus close on its garrison. If the fire of the defense is shifted to meet the new attack, a whole or part of the first wave should take prompt advantage of the change in position or direction of fire to rush directly forward. Riflemen using rifle grenades assist the advance by heavy fire from suitable positions behind the first wave.

19–171. The ability of the platoon leader is displayed by prompt reconnaissance of the ground, by a rapid estimate of what it offers toward facilitating the advance of his men, and by immediate decision upon a simple plan for the use of his combined weapons and of ground to enable him to close with the enemy. His plan should habitually include pinning the enemy to the ground by frontal and flanking fire, under cover of which some portions of the platoon, usually those sent against the hostile flanks, can close by short rushes with the enemy. The training and discipline of the platoon are shown by the skill with which the men carry out the plan of the leader.

19–172. Against a strong hostile resistance, the advance of the platoon at close range will generally be effected by successive rushes of fractions of the assaulting echelon. Enough weapons must continue in action to insure the success of each rush. Frequently the successive advances of the assaulting platoons must be effected by rushes of fractions of decreased size; that is, advance by rushes may first be made by section, and finally by squads or files; but no sub-

sequent opportunity to increase the rate of advance, such as better cover or a decrease of the hostile fire, should be overlooked.

19–173. Whenever possible, the rush is begun by a flank fraction of the assaulting echelon. In the absence of express directions from the captain, each platoon leader determines when an advance by rushes shall be attempted.

The fractions need not be uniform in size; each platoon leader indicates how his platoon shall rush, having due regard to the ground and the state of the fire fight.

19–174. A fraction about to rush is sent forward when the remainder of the line is firing vigorously; otherwise the chief advantage of this method of advancing is lost.

The length of the rush will vary from 30 to 80 yards, depending upon the existence of cover, positions for firing, and the hostile fire.

19–175. As soon as a platoon or a section has overcome a hostile resistance, its leader re-forms it rapidly, and the advance is resumed. If it be impossible to advance for the time being, the ground must under no circumstances be abandoned. The dogged resistance of small elements, clinging to the ground, will in most cases check a hostile counterattack and allow the offensive to be resumed.

19–176. In addition to their mission of covering the advance of the platoon the scouts constitute the advance elements of a filtration into a gap discovered in the hostile front; they should be followed as soon as possible by automatic riflemen and under the protection of their fire, a supporting point gradually built up on the enemy's flanks and rear.

19–177. When penetration is effected at isolated points, these must be constituted as supporting points from which hostile fire is kept down and the enemy's line rolled up toward the flanks; and as bases of departure for a further advance.

Position Warfare

19–178. In a trench-to-trench attack, it is of special importance that every squad should be formed up square to its objective. The platoon leader must satisfy himself that tapes, flags, disks, or other means of indicating the method of forming up for the attack have been established, and that his section leaders understand, and have made their men understand, exactly what they have to do and how they are to advance.

19–179. The section in the first wave debouches from the departure trench or advances from the take-off tape at zero hour (i. e., the designating hour for starting the attack) and moves on its objectives without stopping to search hostile shelters.

It is essential that the advancing line keep as close as possible to the creeping barrage, and that by the rapidity and the continuity of such advance, full advantage be taken of the surprise effect on the enemy. When the skirmishers meet an obstacle (such as a section of wire entanglements), they must move around it, making use of any passage that exists in the wire, trample it down, or cut a path through it.

19–180. When a section encounters hostile resistance, it endeavors to overcome it by combining movement and fire. The automatic rifles and the rifles fire on every exposed target and thus oblige the defenders to conceal themselves, while the hand and rifle grenades are used against objectives under cover. Rifle grenades are especially valuable for the latter purpose.

19–181. The second wave advances toward the objectives, preserving its distance from the first wave until the necessities of the combat demand its assistance. However, when the neccessity does arise, the leader must, on his own initiative, engage his unit wholly or in part, for the following purposes:

(*a*) To take part in any hand-to-hand combats in which the first wave may be engaged.

(*b*) To fill gaps that occur in the assaulting lines.

(*c*) To cooperate in surrounding any local resistance which can not be reduced by the leading wave or by neighboring units which have been delayed in their advance.

19–182. Combat in trenches and communicating trenches is to be avoided by assaulting platoons so long as they have not reached their objectives. This combat is reserved for the cleaning-up units.

Section XI.—GRENADES, ONE-POUNDERS, AND LIGHT MORTARS

19–183. The grenade is a weapon used by the infantry soldier as a supplement to his primary weapon, the rifle and bayonet. Training in the use of grenades is to be regarded as supplementary and subsidiary to training in rifle practice. Men will not be especially designated nor exclusively employed as bombers or rifle grenadiers.

Hand Grenades

[Ordnance pamphlet No. 52]

19–184. The characteristics of the hand grenade are:

(1) Curved trajectory. This quality indicates its principal function as a weapon to kill the enemy sheltered behind cover or under ground or to force him into the open where he will become a target for the rifle and machine gun.

(2) An effective rate under favorable conditions of 10 grenades per minute. This enables a few men to put down an almost impassable barrage on dead ground.

(3) A radius of action varying from 20 to 100 yards, depending on the type of the grenade. The short range of the grenade prevents the use in open warfare of grenades having a large radius of action.

(4) Relatively considerable weight of the projectile, limiting the number which can be carried by the man and thereby diminishing its value as an offensive weapon, except for operations involving a slight advance. The difficulty of supply largely disappears in the defense.

(5) Short range; an average effective range of from 30 to 40 yards may be reckoned on. It is therefore of limited value in the attack against machine guns and other open-warfare objectives; in position warfare where there is often dead ground at close range of the objective it is useful in cleaning up trenches, assisting in the advance through the enemy's trench system, and in village fighting.

(6) Capability of application as an agency for creating a smoke screen. When so used, special types of grenades may be used to conceal troop movements by creating a frontal or flank screen.

(7) Adaptability for use as a vehicle for lachrimatory or irritating gases which can be employed to render dugouts untenable.

(8) Incendiary effect (special types).

In general, the characteristics of the hand grenade indicate its use as a weapon for defense, for minor attacks and raids, and for cleaning up in the preliminary stages of an offensive in position warfare.

Rifle Grenade

(Ordnance pamphlet No. 53)

19–185. The powers and limitations of the rifle grenade are the same as those of the hand grenade except in respect to the following:

(1) Range. The rifle grenade can be fired at ranges of from 30 to 200 yards. It is thus capable of extending the radius of action of the hand grenade. Its increased range makes it of value in open warfare for combating machine-gun nests and strong points and in covering the advance of assaulting troops. Due to the inferior limit of its range, it can not replace the hand grenade in hand-to-hand combat in trenches.

(2) Adaptability to fire from a fixed rest. Due to this property, which enables the fire to be accurately registered, it is preeminently adapted for the purposes of harassing fire in position warfare on objectives such as sentry posts, exists of shelters, enemy assembly points for attack, junctions of communicating trenches.

(3) Considerable weight, rendering supply difficult in offensive operations and requiring great economy in expenditure.

Two types of rifle grenades are used—high explosive and phosphorous.

For further information see Manual for Hand Bombers and Rifle Grenadiers, confidential Army publications.

One-Pounder Gun

19–186. The characteristics of the 1-pounder gun are:

(1) Its mobility and the small space required for its ammunition, which allow it to follow the infantry in any phase of combat.

(2) The ease with which it can be hidden behind a parapet or sunk into the soil.

(3) Ability to deliver masked fire.

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(4) The great ease with which it is adjusted and regulated.

(5) Its great accuracy, which allows it to make direct hits upon embrasures up to 1,200 meters and gives it a useful range of 1,500 meters.

(6) The rapidity of its fire, which, during a short burst, may attain a rate of 20 rounds per minute.

(7) Great visibility of flash of discharge, which permits its location to be easily determined, especially at night, unless proper measures are taken for concealing it. It is always advisable to prepare a number of masked positions which enable the gun to avoid registration by the hostile artillery.

19–187. Its percussion, high-explosive shell is used against troops and matériel, its steel shell against armor. It has little effect against earth shelters. It is primarily designed to destroy by direct fire any machine gun which can be definitely located. For this purpose, it is the most efficient single weapon in the infantry regiment. It is also an effective antitank gun.

Light Mortar

(Ordnance pamphlet No. 123)

19–188. The principal characteristics of the light mortar are:

(1) Limiting ranges of 100 and 1,800 yards. Its most effective range is obtained when the piece is fired at an angle of 45 degrees. The effective range of the mortar indicates its employment in close support of the infantry. On the defensive in position warfare, its weakness when thus employed lies in the fact that the area in which it is emplaced will be constantly subjected to a heavy artillery fire. By carefully noting the normal methods of fire employed by the enemy, it will, however, usually be found possible to avoid hostile fire effect and employ the mortars effectively. They should not, as a rule, be employed close to the front line but should rather be distributed, like the machine guns, over the whole battle area within their range so as to be able to fire to the front and also against as many points as possible in our own positions.

Due to their closer proximity to the infantry engaged in the same battle sector, the light mortars are often better able to adapt themselves to any momentary changes in the struggle and to take quicker advantage of favorable opportunities than the artillery posted at a great distance to the rear. In position warfare they are indispensable in the preparation and support of our own minor operations and for the repulse of hostile operations.

(2) Considerable radius of action as compared with the 1-pounder gun. Due to this quality, it is used in preference to the latter against targets, such as concealed machine guns, which can not be definitely located.

(3) Dispersion less than that of the field gun. It can therefore engage targets which are too close to our own lines to be destroyed by artillery.

(4) Curved trajectory. It is therefore adapted to fire against targets on reverse slopes or under cover. For this purpose it will often prove more effective than artillery.

(5) Considerable weight of ammunition. This quality lessens its value in mobile operations and requires that great economy in the expenditure of ammunition be practiced during such operations and that the system of supply be carefully organized.

(6) Great rapidity of fire. This quality renders the light mortar particularly valuable for barrage and annihilating fire in position warfare where abundant ammunition is available. In mobile operations, the rapidity of fire of the light mortar is to a great extent neutralized by the difficulty of ammunition supply.

(7) Capability of being accurately registered on objectives within the enemy's line. It is therefore adapted to the purposes of harassing fire in position warfare.

The light mortar fires two types of shell—high explosive and phosphorous.

One-Pounders and Light Mortars in the Field

19–189. For an attack, these weapons are best organized into sections, each consisting of a one-pounder gun and a light mortar under command of a section leader.

One or more sections are usually assigned to each attacking battalion; when more than one section is so assigned, the sections are united into a group. The section or group commander reports to and is under the orders of the battalion commander.

19–190. The one-pounder and the light mortar are used to prepare and follow up the attack, to break any resistance which develops in the course of the advance

and to cooperate in the occupation of a conquered position. During the advance, their principal mission is the destruction of machine guns and machine-gun nests. The one-pounder should not as a rule be used against other targets than machine guns or tanks.

19–191. The section or group advances by bounds from one firing position to another along well defiladed routes which should be reconnoitered in advance.

19–192. Reconnaissance of objectives encountered during the advance will determine which weapon can be most effectively employed against them. If the reconnaissance develops a plainly visible target, the one-pounder gun should be used; if on the contrary the exact location of the target can not be determined but only the area within which the target must lie, the fire of the light mortar should be applied.

19–193. The section or group commander must maintain constant touch with the situation and battalion commander. The battalion commander must direct the reconnaissance of the section or group commander and by his own personal reconnaissance exploit every opportunity which the situation offers for the effective employment of these weapons in support of the attack. Group and section commanders must frequently act on their own initiative to take timely advantage of fleeting opportunities.

19–194. In position warfare the one-pounder gun is installed before the assault in an emplacement from which it can efficiently serve the following purposes:

Demolish machine-gun positions which may show themselves at the last minute;

Sweep those parts of the hostile position which are dangerous for the flanks of the attack;

Fire upon the rear defensive lines.

To prevent its destruction, it is advisable to put it into action only at the last moment.

Any use made of the gun prior to the attack must not interfere with its advance with the battalion to which it is assigned.

Section XII.—SERVICE OF SUPPLY

Ammunition Supply

(See Army Combat Principles, Part III, The Service Company, Infantry Regiment, par. 4)

19–195.—The method of supply of ammunition to the combat trains must be worked out in advance, if possible, for each occasion of landing, the local conditions being fully considered.

19–196.—The extra ammunition of a battalion going into action is carried in its combat train. Ammunition is issued from the combat train prior to the formation of the battalion for action.

19–197.—The combat train is the immediate reserve supply of the battalion, and the bn. c. is responsible for its proper use. He will take measures to insure the maintenance of the prescribed allowance all times.

19–198.—The combat train includes all personnel, vehicles, and animals attached to the battalion and the units accompanying it in action for transporting ammunition reserve and special equipment required during combat, including the medical cart or mule. The rolling kitchens and water carts are usually attached to the combat train.

In the absence of instructions, he will cause the train to march immediately in rear of his battalion, and, upon separating from it to enter an engagement, will cause the ammunition therein to be issued.

19–199.—The point at which the combat wagons are emptied is established as the initial ammunition point of the battalion under charge of the munitions officer of the battalion. The emptied wagons are returned to the ammunition-distributing point designated by the regimental commander to be refilled. Ordinarily a rendezvous is appointed for each brigade and the necessary number of wagons sent forward to it from the ammunition column.

19–200.—When refilled, the combat wagons will rejoin their battalions, or, if the latter be engaged, will join or establish communication with the regimental reserve.

19–201.—In maintaining the ammunition supply of the battalion during action, ammunition is pushed forward as far as possible by wagon; then, if practicable, by cart or pack mule; and finally by carriers or reenforcements. Subject

to this general principle, the following may be taken as the basis for the organization of the chain of ammunition supply in action:

(*a*) From the distributing point designated by the regimental commander to the battalion ammunition point: Transportation by the combat wagons of the battalion;

(*b*) From the battalion ammunition point to the battalion reserve: Carts, pack mules, or carriers (preference in the order stated, according to the situation);

(*c*) From the battalion reserve to the company supports: Carrying parties;

(*d*) From the company supports to the assaulting echelon: Reenforcements.

19–202.—Company commanders are responsible that the belts of the men in their companies are kept filled at all times except when the ammunition is being expended in action. In the firing line the ammunition of the dead and wounded should be secured whenever practicable.

19–203.—Ammunition in the bandoleers will ordinarily be expended first. Thirty rounds in the right pocket section of the belt will be held as a reserve, to be expended only when ordered by an officer.

Men will never be sent back from the firing line for ammunition. Men sent forward with ammunition remain with the firing line.

At night it will generally be possible to move the ammunition farther forward by the combat wagons and bring it to the assaulting echelon by carriers.

19–204.—Carrying parties should, when practicable, be detailed from the regimental reserve and attached to assaulting battalions in accordance with necessities.

19–205.—When the ammunition point is displaced as the attack progresses, an agent should be left at the old ammunition point to direct vehicles to the new location.

19–206.—As soon as possible after an engagement the belts of the men and the combat wagons are resupplied to their normal capacities. Ammunition which can not be reloaded on combat wagons will be piled up in a convenient place and left under guard.

Supply

(See Army Combat Principles, Part III, The Infantry Regiment, par. 6, and The Service Company, Infantry Regiment)

19–207.—The rg. c. supervises and directs the service of supply of the regiment. He regulates the movement of the regimental trains between the distributing points of the regiment and the battalion ammunition and supply points or company kitchens. He supervises the issue of supplies at the distributing points and makes timely requisitions for supplies required.

Medical Service

(See Army Combat Principles, Part III, The Infantry Regiment, par. 7)

19–208. As the advance progresses, the medical personnel attached to assaulting battalions collects, dresses, and cares for the wounded at suitable collecting points under the best available cover. The regimental medical personnel takes over the wounded at the battalion collecting points, relieving the battalion personnel, which rejoins its unit; the regimental personnel also furnishes the necessary replacements to the battalion personnel.

During an advance, the regimental responsibility in respect to casualties consists in the collection, dressing, and care of the wounded prior to their evacuation by the divisional sanitary train. Except when acting alone, the regiment has no responsibility in respect to evacuation.

Staff

19–209. To assist him in the execution of his various tasks, the rg. c. has a tactical and administrative staff, comprising an operations officer, an intelligence officer, a liaison officer, a communication officer, an adjutant, a supply officer, and a medical officer. An artillery officer is usually attached for purposes of liaison with the artillery and as a technical advisor in artillery matters. Also a machine-gun officer may act as a technical and tactical assistant in machine-gun matters.

Prisoners, Stragglers, and Pioneer Platoon

(See Army Combat Principles, Part III, The Infantry Regiment, pars. 8 ,9, and 10)

Section XIII.—INTERCOMMUNICATION

19–210. Communication is maintained by means of staff officers, runners, orderlies, carrier pigeons, telegraph, telephone, visual signals, radio, airplanes, and light signals (flares, rockets, etc.). The operation of the technical means of communication is governed by the provisions of United States Army Training Regulations pamphlet 160–5, 162–5, and 165–5.

19–211. The special personnel at the disposition of infantry units comprises signal units attached to brigades from divisional signal troops, the signal platoons of the infantry regiments, and the orderlies and runners attached to the headquarters of the several units.

19–212. Every infantry unit down to and including the battalion has an officer in charge of the communications and the message center of the unit. This officer is known as the communication officer of the unit.

19–213. The message center consists of three sections: A courier section; a record section; a section for liaison agents. The courier section is under charge of an officer or petty officer of the signal platoon and controls the various mechanical means of transmission and all runners and couriers. It determines what means of transmission will be used and is responsible for the prompt delivery and acknowledgment and receipt of all orders and messages. The record section of the message center is under charge of a suitable officer or petty officer. This section is charged with the duplication, recording, coding, and decoding, and keeping the files of messages and orders sent and received. It determines the priority of messages to be sent where this has not been determined by the commanding officer. It prepares the necessary copies of messages and reports for the information of liaison agents and assists in the keeping of the war diary.

The section for liaison agents is directly in charge of the communication officer. All information concerning the units of the liaison agents is sent to this section from the record section. Liaison agents will use their own couriers for messages. They may request the use of the mechanical means of the message center, and the communication officer will assist them as far as possible, but no record is made of such messages.

19–214. In establishing the system of intercommunication, the division pushes forward an axial telephonic line, the head of which is at all times maintained at least as far forward as the regimental posts of command. This axial line should always be supplemented by radio stations, and whenever possible, by visual signaling stations. Brigades make connection with the axial line, employing the signal troops and matériel placed at their disposition by the division. Regiments similarly connect their posts of command or message centers with the axial line, employing the personnel and matériel of their signal platoons. The connection from the regiment forward to the battalions is, in so far as the nature of the operation renders it practicable to do so, also established by the regimental signal platoon under the direction of the rg. c.

19–215. Telephonic communication between the message center of infantry brigades and regiments and the message centers of supporting artillery units is maintained by the artillery. Communication with the artillery should as a general rule be effected through the artillery liaison officer.

19–216. The establishment of intercommunication by personal agents comprises:

A. Mounted messengers or cyclists.

B. Individual runners or runner relays.

Intercommunication by mounted messengers for cyclists is maintained as far forward as the hostile fire and the nature of the terrain will permit. The message center of each unit from which transmission by this means is practicable, should have a number of mounted messengers and cyclists at its disposal. The chain of communication by mounted messengers or cyclists should terminate at a message center.

Runners complete the transmission from the message center where service by mounted messenger ceases to the unit for whom the message is intended. They may operate either singly or in relays of runner posts. The latter method is necessary where heavily shelled areas must be crossed and the greatest possible rapidity of movement is required. When runner relays are employed, the posts should be established at points affording the best possible protection, and the distance between posts should not be excessive (150 to 300 yards). Runner relays are established by higher units, and the posts pushed forward behind the assaulting units as the advance progresses. When practicable, the routes followed by runners should be along telephone lines; in addition to their duties as transmission agents, runners are charged with discovering breaks in the line

and with repairing them if possible; runners have a personal interest in the upkeep of these lines.

Where runner chains are not employed, each infantry unit before deployment sends one or more mounted orderlies, cyclists, or runners to the next higher unit; they serve as transmission agents from the higher unit to their own commanders. Each subordinate unit transmits its messages to the next higher unit and to adjacent units by its own personal agents.

Chains of Signalers

19–217. In clear weather, rocket signals are the best means of rapidly transmitting the requests of the infantry to the artillery. For this purpose, chains of signalers should be organized prior to an attack. These chains should extend as far forward as the front line and should pass through the message centers of the various units; the intervals between posts constituting the chain should be short enough to insure the transmission of signals through fog, dust, or smoke. In order to avoid errors, the general alignment of the chain should be perpendicular to the front, and only signals coming from the front received and transmitted.

Indication by assaulting battalions of their arrival on important terrain lines by means of prearranged rocket signals is one of the most effective methods of insuring effective artillery support and of keeping higher commanders informed as to the situation.

Section XIV.—SUPPORTING ARTILLERY

19–218. Artillery units are temporarily assigned to infantry for the purpose of closer cooperation between the two arms and for fire on objectives which can not be observed from artillery positions located farther to the rear. The success of their action depends upon the immediate advantage taken by the infantry of the results obtained by their fire.

The artillery thus assigned may be divided into two classes: (a) Infantry batteries; and (b) accompanying guns.

19–219. Infantry batteries are batteries employed as units under the direction of infantry brigade or regimental commanders. Accompanying guns are guns engaged as single pieces under the orders of infantry bn. cs.

These assignments are not permanent; they cease upon the execution of the mission for which they were made. Batteries are then returned to control of the divisional artillery commander.

19–220. If a battalion of artillery is assigned to a brigade, a suitable disposition will frequently be to use two batteries as infantry batteries and to break up one battery for use as accompanying guns. Infantry batteries should be fought as batteries, accompanying guns always by piece, each under an officer when practicable.

19–221. When there are two infantry batteries per infantry brigade, one may be assigned to each infantry regiment, or both held under the infantry bg. c. The former disposition is ordinarily preferable when regiments are deployed abreast.

When both infantry batteries are held under the infantry brigade commander, the artillery bn. c. commands these batteries, ordinarily remaining with the infantry bg. c. or in close communication with him. When the infantry batteries are assigned to infantry regiments, the artillery bn. c. supervises the employment of his batteries, as well as the replacement of personnel, matériel, and ammunition.

The missions of infantry batteries include the attack of the stronger points of resistance, defense against local counterattacks, and firing on hostile reserves.

Fire is habitually by direct observation from near the battery position on specific objectives.

19–222. Accompanying guns are assigned to assaulting infantry battalions and placed under the command of the infantry bn. cs. The proportion may be one, or even two, per battalion, depending on the front covered.

Accompanying guns attack hostile machine guns, tanks, and strong points.

Fire is direct in the case of clearly visible or moving objectives; otherwise indirect. The range should be from 500 to 1,500 meters. Ranges are ordinarily estimated. A wide bracket (about 400 meters) is quickly obtained and searched. Ineffective ranges are eliminated during fire for effect.

The pieces are ordinarily moved, horsed, unlimbered under cover, and run forward by hand. Caissons are brought as near the pieces as conditions permit.

Accompanying guns find their protection principally in the small target presented' in concealment by natural features, and in their mobility. Two or more caissons should be assigned for the ammunition supply of each piece.

Nearby infantry reserves should be called upon to assist in ammunition supply and in the movement of the piece when necessary.

19–223. The functions of infantry commanders, having either infantry batteries or accompanying guns under their command, generally consist in indicating missions and supplying information as to enemy and friendly dispositions. Technical details and methods should be left as far as possible to the artillery commander. However, in the absence of a specific mission, the artillery commander should, on his own initiative, use the means at his disposal to locate and attack suitable objectives.

In general, the artillery commander is responsible that the full power of his weapons is developed and aggressively used. The infantry commander must apply this power where it will best assist the infantry.

19–224. Infantry commanders assigning a mission to the battery should state definitely the locality to be fired upon and the positions of friendly troops. The selection of positions should be left within rather wide limits to the battery commander. The time of attack should be arranged after consulting the battery commander as to the time necessary for the latter to go into battery.

19–225. Up to the time of the assignment of a mission the battery commander remains with, or in close touch with, the infantry commander to whom he is attached. When assigned a mission, the battery commander hastens to join the infantry commander whose unit he is to support. After obtaining the necessary information as to the operation contemplated, he makes a rapid reconnaissance of position and meets the battery on arrival in the vicinity or sends an agent to conduct it to the position. The position selected should be at as short a range as is possible, consistent with proper concealment and ammunition supply.

19–226. Visual concealment in position must be had, but protection must be limited ordinarily to that afforded by the natural features of the position selected. The construction of emplacements is carried only as far as is absolutely necessary for firing. Previously prepared sand bags are necessary. Protection for the cannoneers must not be allowed to delay the opening of fire. The deep defilade possible with this piece is ample protection against hostile fire under open-warfare conditions. The moral and material effect of a rapid fire, promptly delivered, is great, but if the fire is delayed, the enemy is allowed to protect his dispositions, all the while inflicting losses on our infantry.

19–227. When a mission has been accomplished the matériel should be at once withdrawn and loaded on the transport for a further advance.

Artillery Supports

19–228. The purpose of the artillery support is to guard the artillery against surprise or attack.

Artillery on the march or in action is ordinarily so placed as to be amply protected by the infantry. Infantry always protects artillery in its neighborhood.

19–229. The detail of a support is not necessary except when the artillery is separated from the main body or occupies a position in which its flanks are not protected.

The detail of a special support will be avoided whenever possible.

19–230. The formation of an artillery support depends upon circumstances. On the march it may often be necessary to provide advance, flank, and rear protection. The country must be thoroughly reconnoitered by patrols within long rifle range.

19–231. In action, the formation and location of the support must be such as to gain and give timely information of the enemy's approach and to offer actual resistance to the enemy beyond effective rifle range of the artillery's flanks. It should not be close enough to the artillery to suffer from fire directed at the artillery. In most cases a position somewhat to the flank and rear best fulfills these conditions.

19–232. The support commander is charged only with the protection of the artillery. The tactical employment of each arm rests with its commander. The two should cooperate.

Section XV.—INFANTRY AND AIRPLANES

19-233. During all offensive operations, the men carrying panels or flares should keep them in a handy accessible position. All men should be thoroughly instructed regarding the airplane signals, markings, and general characteristics of enemy and friendly airplanes. One man from each platoon will be designated especially to watch airplanes. Immediately upon being sighted, an airplane should be closely watched until it is ascertained whether it is enemy or friendly. If it is hostile, preparations will at once be made for firing against it by means of small arms and machine-gun fire, but no firing will be permitted until directed by platoon or higher commanders. If it is friendly, it will be closely watched for signals. If in wooded country or in deep ravines, the panels will not be shown, but Bengal flares will be burnt at such intervals as to mark the salient points of the line. When the airplane gives the signal, "Understood," all panels will be put away immediately, and the flares will be extinguished, if still burning. All regimental and battalion command posts will display their panels upon receiving the signal, "Where are you?" from the airplane. Response must be made only to the airplane which identifies itself by signal as the airplane assigned to the division.

19-234. During combat, every machine gun that is not engaged against terrestrial targets will fire on low-flying hostile airplanes. On the march, machine guns must be prepared to go into action against airplanes on very short notice. To obtain a successful result from rifle fire against airplanes, the combined fire of at least a platoon will ordinarily be necessary; good fire control and discipline and especial instruction in fire against aerial targets are essential to success. Against very low-flying airplanes, single shots may be successful under favorable conditions.

Section XVI.—MEETING ENGAGEMENTS

19-235. Meeting engagements are characterized by the necessity for hasty reconnaissance, or the almost total absence of reconnaissance; by the necessity for rapid deployment, frequently under fire; and usually by the absence of trenches or other artificial cover. These conditions give further advantage to the offensive.

19-236. The whole situation will usually indicate beforehand the proper general action to be taken on meeting the enemy.

19-237. Little fresh information can be expected. The boldness, initiative, and determination of the commander must be relied upon.

19-238. A meeting engagement affords an ideal opportunity to the commander who has intuition and quick decision and who is willing to take chances. His opponent is likely to be overcautious.

19-239. The amount of information that the commander is warranted in awaiting before taking final action depends entirely upon his mission. One situation may demand a blind attack; another may demand rapid, partial deployment for attack, but careful and time-consuming reconnaissance before the attack is launched.

19-240. A great advantage accrues to the side which can deploy the faster. The advantage of a close-order formation, favoring rapid deployment, becomes more pronounced with the size of the force.

19-241. The first troops to deploy will be able to attack with longer firing lines and weaker supports than are required in the ordinary case. But if the enemy succeeds in deploying a strong defensive line, the attack must be strengthened accordingly before it is wasted.

19-242. If the situation warrants the advance, the leading troops seek to deploy faster than the enemy, to reach his flanks, check his deployment, and get information. In any event, they seek to cover the deployment of their own troops in rear—especially the artillery—and to seize important ground.

19-243. The commander of a long column, which meets the enemy should be with the advance guard to receive information promptly and to reconnoiter. If he decides to fight, the advance guard must hold the enemy while the commander formulates a plan of action, issues the necessary orders, and deploys the main body. Meantime, the column should be closing up, either in mass or to form line of columns, so that the deployment, when determined upon, may be made more promptly.

19-244. The action of the advance guard, prior to the receipt of orders, depends upon the situation. Whether to attack determinedly or only as a feint, or to assume the defensive, depends upon the strength of the advance guard, the terrain, the character of the hostile force encountered, and the mission and intention of the commander of the whole.

19–245. If the enemy is beforehand or more aggressive, or if the advance guard is too weak, it may be necessary to put elements of the main body into action as fast as they arrive in order to check him. This method should be avoided; it prevents the formation and execution of a definite plan and compels piecemeal action. The best results are obtained when the main body is used as a whole.

The Surprise

19–246. To be surprised is never justifiable in warfare. If, however, due to insufficient reconnaissance, troops are forced into action directly from a formation unsuitable for combat or come unexpectedly under effective fire of the enemy before development and deployment, boldness in decision and in action is usually the best line of conduct. If the enemy is still beyond close range, quick development of fire is important. Here the artillery must be put into action at once, to deliver a heavy fire upon the most threatening bodies of the enemy. If the enemy is so near that a charge is practicable, recourse to the bayonet must be unhesitating. This principle applies particularly well where troops suddenly encounter the enemy in the local phases of a battle. To attempt to retire at once when surprised is to risk annihilation.

Infantry Against Cavalry

19–247. A cavalry charge can accomplish little against infantry, even in inferior numbers, unless the latter are surprised, become panic-stricken, run away, or can not use their rifles.

19–248. A charge from the front is easily checked by a well-directed and sustained fire.

If the charge is directed against the flank of the firing line, the supports, reserves, or machine guns should stop it. If this disposition is impracticable, part of the line must meet the charge by a timely change of front. If the flank company, or companies, in the firing line execute **platoons right**, the successive firing lines can ordinarily break a charge against the flank. If the cavalry line passes through the firing line, the latter will be little damaged if the men retain their presence of mind. They should be on the watch for succeeding cavalry lines and leave those that have passed through to friendly troops in rear.

19–249. Men standing are in the best position to meet a charge, but other considerations may compel them to meet it lying prone.

19–250. In a mêlée, the infantryman with his bayonet has at least an even chance with the cavalryman, but the main dependence of infantry is rifle fire. Any formation is suitable that permits the free use of the necessary number of rifles.

Ordinarily there will be no time to change or set sights. Fire at will with battle sight should be used, whatever the range may be. It will usually be unwise to open fire at long ranges.

19–251. An infantry column that encounters cavalry should deploy at once. If attacked from the head or rear of the column, and if time is pressing, it may form a succession of skirmish lines. Infantry, by deploying 50 or 100 yards in rear of an obstacle, may check cavalry and hold it under fire beyond effective pistol range.

In any situation, to try to escape the issue by running is the worst and most dangerous course the infantry can adopt.

19–252. In attacking dismounted cavalry, infantry should close rapidly and endeavor to prevent remounting. Infantry which adopts this course will not be seriously checked by delaying cavalry.

Every effort should be made to locate and open fire on the lead horses.

Infantry Against Artillery

19–253. A frontal attack against artillery has little chance of succeeding unless it can be started from cover at comparatively short range. Beyond short range, the frontal fire of infantry has little effect against the artillery personnel because of their protective shields.

Machine guns, because their cone of fire is more compact, will have greater effect, but on the other hand they will have fewer opportunities and they are limited to fire attack only.

As a rule, one's own artillery is the best weapon against hostile artillery.

19–254. Artillery attacked in flank by infantry can be severely damaged. Oblique or flank fire will begin to have decisive effect when delivered at effective range from a point to one side of the artillery's line of fire and distant from it by about half the range. Artillery is better protected on the side of the caisson.

19–255. Guns out of ammunition, but otherwise secure against infantry attack, may be immobilized by fire which will prevent their withdrawal, or by locating and driving off their limbers. Or they may be kept out of action by fire which will prevent the receipt of ammunition.

19–256. Artillery when limbered is helpless against infantry fire. If caught at effective range while coming into action or while limbering, artillery can be severely punished by infantry fire.

In attacking artillery that is trying to escape, the wheel horses are the best targets.

Summary of Combat Principles

19–257. 1. Avoid combats that offer no chance of victory or other valuable results.

2. Make every effort for the success of the general plan and avoid spectacular plays that have no bearing on the general result.

3. Have a definite plan and carry it out vigorously. Do not vacillate.

4. Do not attempt complicated maneuvers.

5. Keep the command in hand; avoid undue extension and dispersion.

6. Study the ground and direct the advance in such a way as to take advantage of all available cover and thereby diminish losses.

7. Never deploy until the purpose and the proper direction are known.

8. Deploy enough men for the immediate task in hand; hold out the rest and avoid undue haste in committing them to the action.

9. Flanks must be protected either by reserves, fortifications, or the terrain.

10. In a decisive action, gain and keep fire superiority.

11. Keep up reconnaissance.

12. Use the reserve, but not until needed or a very favorable opportunity for its use presents itself. Keep some reserve as long as practicable.

13. Do not hesitate to sacrifice the command if the result is worth the cost.

14. Spare the command all unnecessary hardships and exertion.

Chapter 20

DEFENSIVE COMBAT

Section I.—GENERAL PRINCIPLES

20–1. The defensive is a form of action to be deliberately chosen only for the purpose of economizing troops on a front where a decision is not sought in order to concentrate superior forces at the point of decisive action. The defensive may, however, be imposed by the situation.

The **economy of force** effected by a *limited* defensive is the means of preserving the initiative of the commander.

On a defensive front, economy of force (holding out of reserves) is the means of enabling the defender to meet the attacker's initiative and of transforming a defensive attitude into an offensive.

Whatever may be the character of the defense (voluntary or imposed), the tactics of defensive action are essentially the tactics of holding extensive fronts with relatively weak forces.

20–2. All successful defense is based upon the **vigilance and fighting power** of the troops. The principles of defense serve only to give these qualities the best opportunity for their development; they have no inherent value of their own. The defensive forces must quickly discover a hostile attack, promptly form for action, and open fire without delay on the most important objectives.

20–3. The defense, no less than the offense, must, wherever possible, act by **surprise.** The visible lines of a defensive system must not betray the defensive dispositions, but rather act as a mask that conceals the real defensive organization.

20–4. The defense must be **mobile.** Mobility is acquired either by the holding out of large reserves as units of maneuver, or by distribution of the defenses in depth.

The holding out of large reserves as units of maneuver endows the defensive force with mobility by enabling it to meet the attack wherever it develops and to counterattack in force at points of decisive importance.

The distribution of defenses in depth contibutes to defensive mobility by permitting of the offering of resistance to the flanks as well as to the front. Depth of defenses must, however, be adjusted to the situation (see art. 20–10).

20–5. The defense must be **aggressive.** The counterattack is the decisive element of defensive action. It is impossible to hold any defensive system by a merely passive resistance. The defense as well as the offense must act by movement as well as by fire.

Unless all unit commanders seize every opportunity for counterattack, the attacking force must eventually succeed in driving the defenders out of their positions.

20–6. The defense must be **flexible.** The dispositions dictated by a stabilized situation are not adapted to the first contact of opposing forces nor to the moving warfare consequent on the break-up of stabilization. In stabilized warfare, the large force of artillery which the attacker can mass to support his attack requires thinly held front lines and such distribution in depth that concentrated targets will not be offered to hostile artillery. In the war of movement, neither this mass of artillery nor the unlimited supply of ammunition will be available, and inability of our own artillery to recognize and shell the hostile lines will increase the importance of the action of the infantry in resisting the attack. The front lines may and should be therefore more densely held.

Under different situations and at different stages of the occupation of the same position, defensive dispositions will present wide degrees of variance.

The defensive organization will tend toward the line or an area depending on the relative importance to be attached to frontal field of fire and hostile artillery fire effect. It is the task of the commander to adapt his dispositions to the situation with which he is confronted.

20–7. The **tactical principles of open warfare** must be the basis of the organization of units for defense. Whatever elaboration the stationary character

of operations may at any time permit, must not disrupt this organization or produce tactical groupings which will be dissolved the moment the enemy effects a rupture in the defensive dispositions.

Any defensive disposition that presumes the indefinite continuance of stabilized conditions is necessarily defective.

Orders

20–8. The general principles of these regulations relative to the character of orders for the attack apply in large measure to the defense (see paragraphs 19–50 et seq). Due, however, to the more complete organization of which defensive action is capable, orders may go into greater detail as to the defensive conduct of units than in the case of the attack. But the temptation to concentrate all initiative in the hands of higher commanders and to build up an elaborate system based on the technique of the various weapons and the several arms must be strenuously resisted. Such a system will dissolve the moment any rupture in the defensive system occurs and will render a rapid change to the offensive impossible. Tactical unity must be the basis of defense as well as of offense.

Section II.—SELECTION OF THE POSITION

20–9. Regard being had to the special requirements of any situation, the material factors that exercise the greatest influence on the selection of a defensive position are the communications to the rear and the facilities for observation. The features of the terrain that control these factors determine the *general lie* of the defensive position.

Local circumstances determine the more exact location of the position (field of fire, cover, etc., see arts. 20–12 to 20–16).

20–10. The depth of the defensive zone is dependent on the tactical situation, which under all circumstances is controlling. Where a violent bombardment by massed hostile artillery must be reckoned with, the depth of the position must be sufficiently great to force the enemy to scatter his fire over a wide area and so minimize its effects that he will be unable to neutralize the entire defensive system by his preparatory fire. In addition, a second position at such distance from the front line (6,000–8,000 yards) that it can not be taken under fire by the artillery firing on the first position will generally be organized. This will be the most usual disposition in position warfare.

When less weight is to be attributed to the factor of artillery bombardment, the defense will concentrate its means in a shallower zone in order to avoid undue dispersion of its forces and exposure to defeat in detail. The main defense will be made on a *line* of resistance. In rear of the line of resistance and within supporting distance from it, a reserve line, designed to limit the effect of a hostile penetration of the line of resistance, may sometimes be organized. Th iswill be the most usual disposition in open warfare, where the attacker will not have at his disposal the mass of artillery, the unlimited supply of ammunition, or the exact knowledge of the defensive dispositions and of the location of his own attacking infantry that will usually be available in position warfare.

20–11. The value of frontal field of fire varies between wide limits depending on the situation. A long frontal field of fire usually carries with it exposure to hostile view and hostile artillery fire. In the early stages of an engagement in open warfare, however, before the attacker has been able to acquire exact information as to the defensive dispositions and to mass the fire of his artillery against them, the importance of opening fire on the advancing troops at long range and subjecting them to demoralizing losses during their advance, will outweigh these disadvantages. Since at this stage of defense, all infantry fire is necessarily frontal, the initial deployment for defense should, as a rule, be made with a view to the development of maximum frontal fire effect.

The close approach of the attacking forces deprives the advanced defensive position of an extensive frontal field of fire, and consequently increases the importance of flanking action. Rearward defensive lines may retain the full value of frontal field of fire. During a prolonged contact of the opposing forces, the more exact knowledge acquired by the attacker of all defensive dispositions exposed to direct observation and the mass of artillery which he can assemble to support his attack, may, however, neutralize the advantage of an extensive frontal field of fire for all defensive lines within range. It may, therefore, be necessary to sacrifice frontal field of fire in order to escape direct hostile observation; the loss is compensated for by the organization of a dense flanking fire with automatic weapons.

The importance of flanking fire increases with the decrease in frontal field of fire, i. e., in direct ratio with the proximity of the enemy.

It also increases with an increase in the intervals between supporting points. (See arts. 20–13 and 20–31.)

The above considerations determine the order of construction of the elements of a defensive position. (See art. 20–27.)

20–12. Figure 232 shows the advantages and disadvantages of the various sites for lines of defense; the site to be selected will vary according to the relative weight to be assigned the various factors of the situation, which are in the main: Field of fire, artillery support, hostile artillery fire effect, concealment of defensive dispositions, protection of communications to the rear, and observation of the foreground of the position.

(*a*) At *A* (foot of forward slope) there is an extensive field of fire and grazing fire effect. The hostile ground is well observed, and artillery support is good. However, hostile artillery sees the trench *A* and the ground *A*—*B*—*C*. The enemy can direct accurate fire on the position and effectively support his infantry. Communications and the movement of troops in rear of the position are difficult.

(*b*) At *B* (military crest) there is a good field of fire and distant observation, but artillery support is very difficult on the slopes in front of *B*. Field artillery

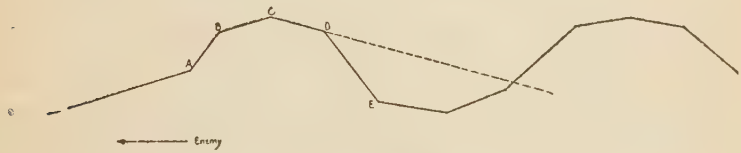

FIG. 232

can effectively reach the slopes close in front of the advance line only by batteries placed in flanking positions. Moreover, hostile artillery readily sees the trench *B* and the ground *B*—*C*. The slope *A*—*B* permits the enemy to support his infantry to within a very short distance of the trench *B*.

(*c*) At *C* (topographical crest) there is distant observation, but field of fire *C*—*B* is usually short. All terrain in rear of *C* is concealed from hostile observation. Communications are protected. Artillery support on the terrain *C*—*B* is very difficult, as this terrain is seen only from *C*.

(*d*) At *D* (reverse slope) distant observation of the enemy is entirely lost. The field of fire *D*—*C* is short, but there are no difficulties of close artillery support. The enemy has distant observation from *C*, but, beginning at *D*, the terrain has a large dead angle screened from enemy observation. Hostile artillery will have difficulty in firing on the slope *D*—*C*.

(*e*) At *E* (foot of reverse slope) there is the benefit of good support by artillery, and, on the other hand, hostile artillery support will be difficult. All ground in rear of *E* is subjected to hostile observation and fire.

No absolute rule as to which position should be occupied can be prescribed. It will sometimes be advisable to establish the line of resistance on the reverse slope with a line of observation on the forward slope or to place the line of resistance on the forward slope (foot of forward slope or military crest) and a reserve line on the reverse slope.

A reverse-slope position can as a rule be effectively defended only when points affording the observation required for the effective action of the supporting arms of the defense are retained and those giving views into the defensive dispositions are denied to the enemy. Such a disposition permits of the full development of the fire of the supporting arms of the defense and reduces the effectiveness of the fire of the supporting arms of the attack. When a reverse-slope position is held, the loss of frontal field of fire must be compensated by the organization of a dense flanking fire by automatic arms. The supporting arms must be able to prevent the enemy from occupying the crest in front, or the infantry must be capable of at once ejecting by counterattack any hostile element which succeeds in effecting a lodgment on it.

The conditions required for the effective defense of a reverse-slope position will often be difficult to realize.

Section III.—DEPLOYMENT FOR DEFENSE

20–13. A position should not as a rule be defended by an occupation in uniform density along the entire front, but rather by holding in strength the tactical localities which constitute the key points of the position and by providing for the main defense of the intervals between such points by flanking fire and counterattack. The key points of a defensive system are, in the main, points that control the communications of the defense and are therefore indispensable to the sustained progress of the attack (road centers, villages, etc.), and the features of the terrain which afford extensive views either into the defensive position or over the foreground. Features of the terrain that afford cover or concealment or good fields of fire and flankings constitute minor tactical localities.

By strongly holding these tactical localities as supporting points, the defense aims to limit the hostile penetration of its position and overwhelm the penetrating elements by counterattack at a time when they are at a relative disadvantage in respect to supporting fire and to communications and supply. The superiority of the defense in this respect should be pronounced, since the penetrating force will have lost in large measure the support of its artillery and will dispose only of such communications as it is able to improvise in the stress of battle while the supporting fire and the communications of the defense are unimpaired.

If the defender succeeds in holding the flanks of the gap so strongly as to resist all attempts to widen it, it will be difficult for the attacker to maintain himself in the deep salient with a narrow base which the penetration has created.

20–14. The line of resistance is the line which must be held by the troops assigned to the defense of the position. It is not essential that the actual resistance be offered on the line of resistance; the defense may sometimes be most effectively made over a zone of resistance in which the actual line of resistance is included, and combat delivered in and about the assigned line for its possession. The conclusion of the engagement must in any case find the assigned line of resistance in the possession of the defending force. When a position is to be held by the defense of a zone, the lines to be held by each of the echeloned elements must be clearly defined in orders of the proper commanders.

Resistance is therefore offered on a series of tactical localities organized as supporting points, and separated by such lateral intervals and echeloned in such depth as circumstances of the particular situation may require.

The assignment of a line of resistance defines the mission of the defending force.

20–15. The troops of the defense are disposed in a depth varying with the tactical situation. The objects to be accomplished by the distribution in depth are:

(*a*) To provide security and gain time for manning the defenses of the main line of resistance;

(*b*) To avoid concentrations which would expose the defensive forces to excessive losses and neutralization by hostile fire;

(*c*) To limit the effect of surprise attacks and to permit the offering of lines of resistance to a flank as well as to the front.

20–16. When the main defensive position is preceded by an outpost zone, the larger infantry units, regiments, and brigades are generally deployed in sectors extending over both zones; battalions and smaller units over one zone only. The deployment in depth is, however, dependent on the frontage assigned to the unit; units assigned a narrow frontage deploy in relatively great depth.

When the defensive organization comprises one zone of resistance only, each battalion in the first line furnishes the outguards for its own front.

Unity of command and tactical control exercise an important influence on the nature of the deployment. A unit assigned to an area in which the depth as compared with the frontage is very great is more effectively controlled by disposing the component units in depth (in column), while in the inverse case control is more effectively insured by disposing them abreast.

20–17. Whether disposed over one or two zones, combat under any particular situation is delivered for the defense of one main line of resistance only. Where two zones are held, no doubt must exist as to the zone in which the principal resistance is to be offered. When the principal resistance is not to be offered in the advanced zone, the function of the first line units is that of an outpost; i. e., the security of the command, the repulse of minor attacks and raids, and the prevention of the occupation of the foreground of the position by the enemy. The strength of the outpost should not exceed that required for the security

of the combat troops. The outpost holds its position in case of attack unless a withdrawal is ordered by higher commanders.

Under circumstances where an overwhelming bombardment of the position may be expected, the line of resistance is held by the defense of a zone in which the resisting elements are disposed in echelon (checkerboard formation), each flanking the front or covering the flanks of the others (see art. 20–68). Whether the position is held by defense on a line or over a zone, the aim in either case must be the same: To unify all means of defense and to avoid dispersion of effort.

Distribution in depth does not imply dispersion of force. The successive elements of the defense must be within supporting distance of each other. Supporting distance is such as will permit of effective support by fire and counterattack.

20–18. Units assigned to the defense of any position are generally deployed in two echelons: A holding garrison designed for the immediate defense of a portion of the position and a support or reserve which has the mission of counterattack or of reenforcing the holding garrison.

When defenses are distributed over a considerable depth, extreme localization of supports will often be necessary; a platoon will frequently hold out a support.

20–19. When troops are deployed over two zones of defense, units in the outpost zone are deployed into supports (security echelon) and a reserve. Units in the battle zone are deployed into a combat echelon and a reserve; the echelons are similarly designated when deployed on a single line or over one zone of defense.

20–20. The strength of the forces held in reserve depends upon the character of the defense, whether passive or seeking a decision. In a defense of either character the total strength of the forces assigned to purely holding missions remains practically constant; the character of the defense is indicated by the strength of the reserves. In a passive defense the forces available for counterattack are made large enough only for expelling hostile troops which may penetrate the position, while in the defense seeking a decision as large a counterattacking reserve as possible is held out with a view to striking a telling blow and winning a decisive victory.

In a passive defense or delaying action supports and reserves may therefore be relatively weak.

20–21. Contact detachments, including machine guns, are assigned the mission of reinforcing the defense on sector boundaries and of maintaining tactical contact between adjacent units. They vary in strength from a squad to a company. These detachments are, where practicable, assigned a definite sector of defense. Their mission is either to counterattack and drive out any hostile elements penetrating in their sector along the boundaries between units or to limit the effect of a hostile penetration by holding an oblique switch line connecting an advanced position with a rearward position on the flank; in either case, to protect the flank of the unit in case of hostile penetration of the adjacent sector. Contact detachments are usually detailed by battalions and larger units. They operate under the orders of the unit by which they are detailed.

20–22. The distribution of machine-gun units is dependent upon the tactical situation and varies with distribution of the troops which the machine guns support. When the main defensive position is preceded by an outpost zone, machine guns are not as a rule located in advance of the outpost line of resistance. A certain number participate in the defense of the outpost zone by delivering flanking fire through the intervals between supporting points or overhead fire from commanding positions in rear. The greater part of the machine guns are employed in the defense of the battle zone, and are distributed throughout the battle zone and over a limited zone of depth in its rear. When employed in the defense of a zone, machine guns are echeloned in checkerboard formation in such manner that each element flanks the front or covers the flanks of adjacent elements, and, when practicable, is capable of delivering overhead fire over the defensive elements in its front.

The distribution in depth of machine guns decreases with the general contraction of the defensive zone. As the organization of the defenses approaches the linear a larger number of machine guns are concentrated farther forward, and machine guns may be emplaced in or near the line of resistance. A considerable number should even in this case be distributed over a limited zone in rear of the line of resistance.

20–23. The machine guns form the skeleton of the defensive organization. They are so sited that as nearly as practicable they cover the entire width and depth of the zone of resistance with continuous bands of fire. Infantry combat groups are so disposed that they cover the ground which is dead to machine-gun

fire and are, at the same time, independently of the machine guns, capable of covering the field of fire to their front and in front of the intervals between them and adjacent combat groups. Light mortars are so sited as to cover dead ground in the bands of machine-gun fire or other important dead spaces, or to supplement the artillery barrage in case a barrage is contemplated.

While the automatic rifle is most effective when employed in a flanking direction and should be so employed when opportunity offers, it can not, due to the absence of a fixed mount, be laid on a definite line of fire like the machine gun. The automatic rifle will not, as a general rule, be restricted to definite lines of fire; it will execute frontal fire on an enemy advancing directly toward it and flanking fire against troops advancing on adjacent units, as the occasion requires. It should always be so sited that it can deliver flanking fire across the front of the adjacent combat group.

The one-pounder gun is not assigned a definite zone of fire; it is rather employed as a weapon of opportunity against hostile tanks and machine guns. It is preferably emplaced where it can cover the principal approaches to the defensive position.

The assignment of attached artillery, machine guns, one-pounders, light mortars, etc., to battalions in the defense is made in accordance with the same general principles as in the attack (arts. 19–189, 19–220, 19–221).

20–24. Artillery units or single pieces are attached to infantry units and placed under the orders of the infantry commanders. Their missions are close support of infantry in defense, antitank defense, and accompaniment of counterattacks. The principles of the employment of such artillery are in general the same as those of infantry batteries and accompanying artillery in the offense. During periods of stabilization a certain proportion are held as silent guns, which open fire only in case of attack against hostile infantry, machine guns, and tanks, while others are employed for daily firing on targets which are particularly troublesome to the infantry. The divisional artillery retains responsibility for the supply of ammunition and stores to artillery units attached to the infantry. Attached artillery remains under the orders of its higher commanders for administration and discipline.

In the attachment and detachment of artillery units, orders must leave no doubt as to the commander under whose control they are to serve and as to the time when they come under and pass from his control.

20–25. In deployment for defense, as well as for offense, the integrity of tactical units must be maintained. It is prohibited to segregate men of rifle companies into groups of specialists (autoriflemen, riflemen, handbombers, rifle grenadiers, etc.). Such groupings can only be effective so long as a stabilized defense can be maintained and will dissolve as soon as a rupture in defensive dispositions occurs or it becomes necessary to take the offensive. Infantry on the defense will fight as on the offense in combat groups of uniform composition (squads, sections, and platoons).

Section IV.—TACTICAL ORGANIZATION OF THE GROUND

20–26. In principle, infantry on the defensive intrenches. The extent of the defensive works depends upon the time available for their construction.

In the hasty occupation of a position, it is first of all important to locate the troops so as best to take advantage of the features of natural strength. Fortifications are constructed with a view to increasing the natural strength of the position as permitted by the time available.

20–27. The defense is made on a series of supporting points (linear or echeloned). In the initial deployment for defense, supporting points will be disposed in an approximately linear distribution. In a protracted defense they will be echeloned in depths as well as in width. The organization of the supporting points themselves will also vary widely at different stages of the defense. At first, they will consist of simple lengths of trench sited for frontal and flanking fire and paralleled by cover or fire trenches for local supports and reserves. As soon as practicable, these are connected with each other by communicating trenches and developed into closed works capable of all-around defense.

The first immediate necessity in the construction of a line of supporting points is the front line with a continuous obstacle and cover for supports and reserves.

In prolonged occupation of the defensive position, splinter and bombproof shelters are constructed, and numerous alternative combat emplacements are developed. Dummy trenches are constructed to divert the fire of hostile artillery.

20–28. In combat exercises when it is impracticable to construct the trenches appropriate to the exercise, their trace may be outlined by bayonets, stakes, or other markers, and the responsible officers required to indicate the profile selected, method and time of construction, garrisons, etc.

20–29. The distance between the several lines of trenches or combat emplacements parallel to the front should, when practicable, be such that:

(*a*) The garrisons of the rearward lines are able to cover by fire the flanks of the combat emplacements of the line immediately in front of them.

(*b*) The garrison of each rearward line does not fall within the zone of dispersion of hostile fire directed on the line immediately in its front, and friendly artillery can fire on hostile troops which have occupied one line without endangering our own troops in another. The safe zone of light artillery is 100 yards. That of heavy artillery is 300 yards.

(*c*) Rapid counterattacks against the flanks of hostile elements penetrating the position are facilitated.

20–30. All lines should, when practicable, be sited and constructed with a view to recapture by counterattack or to rendering them untenable to the enemy by fire from rearward lines.

20–31. The general direction of parallels and approaches is determined by the general direction of the front to be defended; their site by the considerations set forth in paragraphs 19–16 to 19–20; their trace by the field of fire, frontal, oblique or flanking, to be covered.

In general, the trace follows the contour of the ground. Salients and reentrants are created only to the extent required for the efficient action of such flanking weapons as are to be emplaced in the trenches. As far as practicable, the natural salients formed by the ground forms are utilized as the flanking salients of field works.

The main flanking defense is furnished by weapons emplaced outside of the trenches. Machine guns are, as a rule, sited in positions detached from the trenches.

The most efficient flanking defense is rendered by weapons characterized by penetrating force and rapidity of fire (automatic arms).

Flanking defenses, in combination with obstacles that arrest the enemy under the fire of flanking weapons, are the principal means of effecting the **economy of force;** which is the essence of all defensive action.

The direction of fire of flanking defenses permits of their concealment from the direct frontal observation of the enemy. They therefore have the advantage of being able to act with the effect of surprise, in addition to the protection afforded by concealment. Since the conditions which make concealment from direct frontal observation a factor of the first importance are the same as those requiring great distribution in depth, the intensive development of flanking defenses is a distinguishing characteristic of the defense in depth.

Flanking defenses permit the defender to sacrifice *extensive* frontal field of fire. A line established on a reverse slope near the crest may become extremely strong due to good flanking defenses of the ground immediately in front of it.

The weakness of flanking defenses lies in their exposure to frontal attack. Their effectiveness, therefore, depends upon the efficiency of the frontal defensive elements. A position can not be held by flanking defenses alone. If frontal resistance is destroyed, the flanking defenses must fall. Frontal and flanking defenses must mutually supplement one another.

20–32. The purpose of the *flank elements of field works* is to enable the garrison to offer lines of resistance to a flank as well as to the front. While in an initial deployment for defense, the construction of the frontal elements is of the first importance, provision must be ultimately made in the stubborn defense of a position for meeting an attack from a flank. The danger of disposing the defensive forces with a view to resistance of an attack from a preconceived direction must be avoided. Hostile penetration of an adjacent sector may radically transform the direction of the attack. Regard must also be especially had to this contingency in disposing the flanking defenses; flanking weapons are therefore as a general rule best disposed when they have a field of fire in as many directions as possible.

20–33. The purpose of parallels and approaches is to assure communications laterally and to the rear and to furnish combat emplacements on more or less extended lengths. The defense of intervals between combat emplacements is assured by the flanking fire of the combat groups holding these emplacements and of combat groups and machine guns situated to the rear. The combat emplacements should be selected with this end in view.

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20–34. Approach trenches connect the various parallels with each other and the rear. In siting approach trenches, the advantage to be gained by incorporating them into the defensive system as lateral lines of defense should be considered. (Fig. 233.)

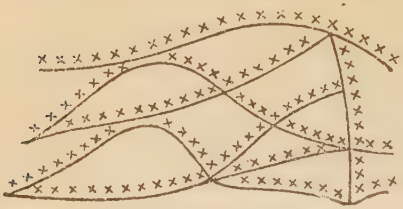

FIG. 233

20–35. Obstacles should be organized as soon as possible in order to hold the enemy under the fire of the defenders as long as possible. Obstacles are of no value unless they are thoroughly swept by fire. A combination of obstacles and fire is equivalent to an increase of fire power.

20–36. In general, obstacles are employed for two purposes:

(*a*) To prevent a sudden irruption of hostile forces into the front line of defense;

(*b*) To hold the attacking forces as long as possible under the flanking fire of automatic weapons.

The general lie of obstacles therefore depends upon the flankings. The plan of obstacles and the flankings should be considered at the same time.

20–37. By a proper coordination of the flankings and the obstacles and a suitable arrangement of gaps, attempt should be made to canalize the attacking troops into certain avenues of approach where they will come under the destructive fire of machine guns. (Fig. 234).

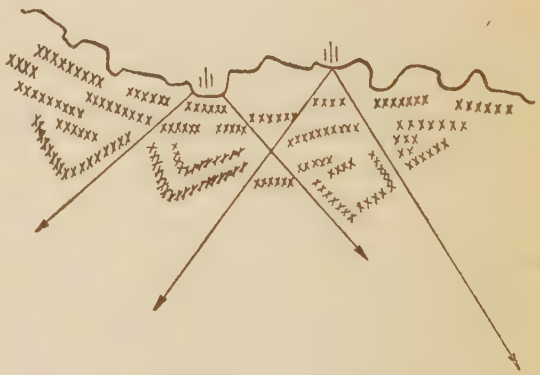

FIG 234

20–38. Command posts should be selected with a view to observation. They should, if practicable, be so situated that commanders have an uninterrupted view forward, backward, and to the flanks, to the next higher command post, and over the foreground, and can keep up communication by messengers. In addition, special observation stations should be established on the commanding points of the terrain in such manner that the entire foreground and all ground within the position itself is under constant observation.

Section V.—CONDUCT OF THE DEFENSE

20–39.—The conduct of an outpost as an agency in the service of security of the defense is described in Art. 16–56 et seq.

20–40.—While the hostile attack is developing, patrols in front of the line of observation delay and harrass the enemy while retiring on the defensive position. Especially strong patrols with machine guns operating well to the front may be assigned this mission. By their fire and their movement in retirement, if practicable in conjunction with dummy works, they endeavor to deceive the enemy as to the defensive dispositions, lead him in a false direction, and cause him to deploy prematurely and on incorrect lines. They occupy successive positions on commanding ground and take advantage of every opportunity to open a heavy surprise fire on formed bodies of hostile troops, without, however, permitting their retreat to be cut off.

20–41. While the engagment between the covering detachments of the two opposing forces is developing, long-range artillery opens fire on hostile communications, road centers, and other sensitive points in the zone of the attack. As the attacking troops approach more closely to the defensive position, field artillery, machine guns, one-pounders, and light mortars open fire on the advancing infantry and on located or suspected assembly points of reserves.

20–42. Infantry opens fire on favorable objectives at mid range. Such fire can not, however, have any further effect, in addition to the losses which it inflicts, than to delay the defender's advance. The attack will always succeed in reaching assaulting distance from the defensive position, either under the cover of darkness or of fog or under the protection of its own fire. The delay effected will, however, gain time for the defense to perfect its dispositions and reinforce the threatened point.

20–43. When the front and direction of the hostile attack has been determined, the defense at once takes steps to meet it. Fire on the advancing infantry is continued, the outguards are withdrawn, and the defense on the threatened front is reinforced. The reinforcement does not as a rule provide for an increase in the number of men assigned to the holding garrisons; it is generally applied to the reserve. The result of the reinforcement is to increase the force designed for aggressive action rather than that intended for merely passive defense. Against minor attacks, the reinforcement may be effected by transferring the reserve of adjacent units to the threatened sector.

20–44. When the assault forms up at close range to the front line, the outguards set up the appropriate signal (rocket) for annihilating fire from the line of observation in case they discover a hostile concentration for attacking in their front. In case the plan of defense contemplates an artillery barrage, they similarly set up the signal for artillery barrage either from the line of observation or when close enough to the line of resistance to insure their not being cut off by the friendly barrage. Outguards repel hostile patrol enterprises on the line of observation. Where the defense is made on two zones of resistance, the outpost repels minor attacks and raids on its line of resistance.

20–45. In order that the hostile attack may be prevented from reaching the line of resistance, the defense must gain and maintain fire superiority over the attack. In defense, fire superiority is obtained, not by the volume of fire, but by a well aimed and well directed fire, which inflicts losses on the enemy and causes his fire to become inaccurate.

20–46. As a general rule, the defense can not gain fire superiority by virtue of superiority in the means which it puts into action. The ability to attack as a general rule presupposes superiority of means on the part of the offense. The defense must rely for fire superiority on the more methodical organization of its fire, especially its flankings, more accurate knowledge of ranges and of the terrain, the protection afforded by intrenchments against hostile fire, the concealment of its dispositions, and the disorganization which movement and the accessory defenses produce in the attacker's disposition.

20–47. During the advance of the attacking troops, the artillery and machine guns, using direct or indirect fire, subject the hostile infantry to a destructive fire. The infantry batteries, trench mortars, 1-pounders, and machine guns open fire on hostile infantry and its accompanying weapons, machine guns, automatic rifles, and tanks.

20–48. At night or in a fog, the flanking fire of the machine guns constitutes a vital element in the defense of a position. As these weapons can be laid on their lines of fire by day, they retain their full accuracy in night firing. A single machine gun can by flanking fire repel the most determined assault against the front which it covers. At night or in a fog the holding garrisons of supporting points should be considerably reinforced.

20–49. Rifle grenades or hand grenades are used against hostile troops which have taken cover and can not be reached by direct fire; and in repulse of night attacks.

20–50. A unit intrusted with the defense of an area or a position must under no circumstances abandon it unless it has been authorized to do so in certain contingencies by higher commanders.

20–51. During the assault, adjacent units support each other with flanking fire. Should the assault succeed in reaching the defensive position, riflemen leaping on the parapet meet the enemy with the bayonet.

20–52. Should the enemy succeed in penetrating the position, the defender should aim to strengthen the flanks of the gap and maintain his hold on the tactical localities (supporting points) on either side of the gap, resist all attempts to widen it, and counterattack on the flanks of the salient rather than to attempt to close the gap by throwing troops across the head of the salient. For this reason, the organized areas held by units of varying importance which constitute the tactical localities of the defense, should have lines of resistance to the flanks similar to those to the front. From these lines of resistance the garrisons of the

organized areas take the penetrating elements under a destructive flanking fire, arrest their progress, and prepare and support the counterattack.

20–53. Every infantry unit should take immediate advantage of any gap occuring behind a hostile force which has succeeded in penetrating the defensive position, to filter groups or units through the gap with a view to building up a strong point in the enemy's rear. The demoralizing effect of fire from the rear will often produce important results.

20–54. If the enemy is defeated, he will be in no position to withstand a determined counteroffensive. The defensive must be prepared at all times to change to the offensive and exploit the results of successful defensive action.

Section VI.—COUNTERATTACK

20–55. The counterattack should be made vigorously and at the proper time. It will usually be made:

By launching the reserve against the enemy's flank when the attack is in full progress; this is the most effective form of counterattack.

Straight to the front by units in the first line with their supports after repulsing the enemy's attack and demoralizing him with pursuing fire.

Or by the troops in rear of the first line when the enemy has reached or penetrated the position.

20–56. Every unit at once expels by counterattack, any hostile force penetrating its area, zone or sector, unless a withdrawal has been authorized by higher commanders.

20–57. Counterattacks include:

Immediate counterattacks by infantry only (front-line troops, local supports and reserves).

Counterattacks with artillery preparation or accompanied by tanks or infantry guns (sector and general reserves).

20–58. Counterattacks against an enemy who has penetrated the position should be launched as soon as possible before the enemy has had time to organize the ground.

20–59. Units held in reserve for purposes of counterattack should be assigned a definite place for formation for counterattack and approaches to the advance positions carefully reconnoitered.

Section VII.—DELAYING ACTION

20–60. When a position is taken merely to delay the enemy and withdraw before becoming too closely engaged, the important considerations are:

If the position is taken up on open ground, the enemy should be forced to deploy early, in order to permit of a timely withdrawal. The field of fire should therefore be good at distances from 500 to 1,200 yards or more; a good field of fire at close range is less important.

The ground in rear of the position should favor the withdrawal of the first line by screening the troops from the enemy's view and fire as soon as the position is vacated. Exceptionally favorable conditions in this respect may make extensive field of fire less essential (e. g. as in woods).

20–61. On open ground, the defense is made by groups holding the natural strong points of the terrain, separated by considerable distances. Supports are needed chiefly for the protection of the flanks of the strong points. Reserves should be posted well in rear to assist in the withdrawal of the first line. Infantry batteries and single guns, and machine guns are especially valuable to a delaying force.

Section VIII.—POSITION WARFARE

20–62. The general principles of defensive combat apply to the defense in position warfare. The chief peculiarities of the defense in position warfare are those due to the length of time the opposing forces remain in contact prior to the stage of decisive action. Every feature of the defense which in open warfare can only be covered by general instructions is intensively organized in position warfare.

20–63. The chief characteristics of the defense in position warfare are:

(1) The intensified development of all defensive works made possible by the length of time available;

(2) The vast amount of artillery of all calibers, ammunition and other matériel which the stationary character of operations permits the opposing forces to assemble;

(3) Consequent necessity for the distribution of the defensive forces in great depth, in order to avoid offering concentrated targets to the attacker's artillery;

(4) Superorganization of the service of information by means of permanent observation posts and aerial photography and consequent necessity for careful masking of all constructions;

(5) Possibility of the accurate registration of fire on objectives, which, in conjunction with the unlimited supply of ammunition, permits of the use of defensive barrages, annihilating fire on specified areas, harassing fire, interdiction fire, etc.;

(6) Detailed organization of all defensive action.

20–64. The defensive dispositions in position warfare comprise:

(*a*) A first position, organized in depth and preceded by an outpost zone when the main line of resistance is not located in the advanced zone of the position. This position will be on the ground where contact has already taken place with the enemy.

(*b*) A second position, chosen and occupied under the protection of the first and sufficiently distant from it to insure that it can not be taken under hostile artillery fire at the same time as the first. Intermediate positions are organized throughout the zone of depth between the two positions.

(*c*) Switch positions are organized for the purpose of maintaining the continuity of the front in case the enemy breaks through at one or several points. Switch positions are oblique to the front and usually follow the natural contour of the ground. They serve as bases for counterattack as well as to limit the effects of a hostile penetration.

20–65. The troops assigned to the defense of the first position comprise:

(*a*) The outpost (when an outpost zone is held);

(*b*) The combat troops;

(*c*) The reserve.

20–66. The line for the defense of which resistance is to be made is defined in the orders of higher commanders.

20–67. As a general rule, the second position is not permanently occupied. It will usually be sufficient to have a certain number of reserve units near enough to assemble at the position in case of an alert. Special units are permanently designated for switch positions during an alert.

20–68. The defense can not be successfully made on rigid lines of trenches. Any position that is once located can be knocked to pieces by the expenditure of sufficient ammunition. The defensive organizations must therefore be distributed over areas of such extent that they can not be destroyed or neutralized by hostile fire. Combat groups and machine guns are distributed in checkerboard fashion, occupying inconspicuous points of the terrain and located within supporting distance from each other. Well-defined targets must in no case be offered to hostile fire. Isolated woods, farms, etc., which will be subjected to heavy hostile fire should be avoided. The visible lines of the defensive system must not reveal the defensive organization. The more numerous the defenses of all kinds, the more widely they are distributed over the ground, the more effective their concealment from the enemy's air and ground observation, the more difficult it will be for the enemy to detect the most important points and to concentrate his fire on them.

20–69. The defense must be based upon the foreknowledge that all trenches will be subjected to the hostile preparatory bombardment. Losses will therefore often be much slighter if the troops are posted in open ground or in shell holes. The trenches and fortified points will then absorb the hostile fire and mislead the enemy. Combat emplacements should be selected for all units on these principles. Such emplacements may be to the front, to a flank, or as far as the nearest supports, to the rear, into areas which are less exposed to hostile fire.

20–70. The principal purpose of the trenches is in general to serve as avenues of communication and protection against weather in quiet periods. They are none the less important. Without them the fighting capacity of the troops falls off rapidly and the service of supply becomes very difficult.

20–71. The only forms of protection against fire, of permanent value, are dugouts and concrete shelters of sufficient depth or resistance to withstand high-power artillery. Deep dugouts in the front lines do not permit of the prompt egress of troops, and in case of attack become mere mantraps. Concrete shelters in the advanced zone should be constructed wherever practicable.

Dugouts and concrete shelters are an essential means of conserving the fighting capacity of the troops. Effort should be made to accommodate all reserves in shellproof shelters. Dugouts or groups of dugouts should enable troops to be accommodated by complete units in order to facilitate command and supply.

20–72. The commander of each unit prepares a plan of defense and a plan of work which he transmits to his successor when relieved.

20–73. Special forms of increased readiness for action are provided in case indications of a hostile attack are observed. The measures to be taken comprise:

(1) Outpost and combat troops occupy their combat emplacements.

(2) Men engaged in special tasks or temporarily detached report to their units.

(3) All observers occupy their posts.

(4) Work in the battle and outpost zone ceases.

(5) Reserves (troops at rest) stand in readiness to move; wagons are loaded and horses are harnessed.

(6) All means of communication are tested and telephones are manned by officers.

Special dispositions in case of fog must be taken. The number of sentries is increased, runner chains strengthened, and the outpost garrison, if necessary, reinforced.

Section IX.—ANTITANK DEFENSE

20–74. When an attack by tanks in force must be reckoned with, special measures for antitank defense are necessary. These comprise:

(*a*) Antitank redoubts.

(*b*) Tank traps, mines, barricades, and other obstacles.

20–75. Antitank redoubts are usually strong points of the general system of defense, especially equipped with the means of antitank defense and constructed with especial view to checking the advance of tanks.

The special armament of an antitank redoubt comprises machine guns using armor-piercing projectiles, light artillery pieces, and 1-pounders.

The redoubts are located along the approaches most favorable to the advance of tanks. In the distribution of antitank defenses the fact that marshes, watercourses, thick woods, and very steep slopes constitute obstacles to the advance of the tanks should be considered. A stream with a firm bottom is no obstacle unless the water is at least 4 feet deep. A deep swamp or a stream with a soft bottom is an effective obstacle.

20–76. Tank traps, mines, barricades, and other obstacles should be so located as to be under the close-range fire of the defense. Obstacles may be constituted by damming brooks, so as to form marshes, making slashings across roads, placing tank traps at road defiles and along forest paths, or by barricading the exit of villages. Strong bridges may be destroyed and replaced when necessary by lighter bridges. Slopes should be cut with a sharp vertical wall at least 6 feet high in the direction facing the tanks and 10 feet in the opposite direction.

In order to constitute a serious obstacle in soft or medium ground, a ditch should be at least 14 feet wide and 8 feet deep. A ditch across a road is more effective if dug at points where the ground on either side of the road is not suitable for the passage of tanks. It may be lightly bridged to take horse traffic.

20–77. Machine guns open heavy fire on approaching tanks, especially against the aperture through which the operator directs the movement of the tank. Infantry takes cover from the view of tanks which have penetrated the position, so far as compatible with its mission, usually giving way to one side of the line of approach. It must be prepared to resume its combat emplacements immediately after the passage of the tanks and open fire on the hostile infantry which follows them.

THE DEFENSE PRINCIPLES OF VARIOUS MILITARY UNITS

For more detailed instructions in the handling of the squad, section platoon, company, battalion, regiment, and brigade, in defense see Army Combat Principles, Part III, under the unit concerned.

Part III also contains the combat principles of the machine-gun section, platoon, and company.

The foregoing defensive combat principles (ch. 20) are more or less general and should be read before studying the more detailed principles given in Part III.

Chapter 21

SPECIAL OPERATIONS AND MINOR WARFARE

Section I.—NIGHT OPERATIONS

(See Army Combat Principles, Part III, rifle section, pars. 11-15; rifle platoon, pars. 19-25)

21-1. The object of night operations may be to effect a secret concentration before an attack; to gain time; to effect an approach to a hostile position with a view to launching an attack at daybreak; to cross a zone made impassable by hostile fire by day; to effect a withdrawal; to deliver an attack; to execute a reconnaissance; or (in position warfare) to effect a relief, execute works under the cover of darkness, or bring up supplies on roads under hostile observation.

21-2. Night operations are characterized by:

(*a*) Decrease in the effectiveness of aimed fire and corresponding increase in the importance of the means of close combat, of the defensive fire of fixed weapons that can be laid on a definite line of fire by day (machine guns), and in general of the importance of movement.

(*b*) Difficulty in the maintenance of control and of contact and communication between units, with consequent necessity for close formations. Decrease in the effectiveness of fire permits of dense formations.

(*c*) Difficulty in the maintenance of direction and consequent necessity for the limitation of objectives.

(*d*) Highly sensitive morale of troops with consequent increase in the importance of the effect of surprise on the part of the offense and of the service of security and the preparation of ambushes on the part of the defense.

21-3. Night marches must be carefully prepared. The column must be kept well closed up, advance and rear guard distances greatly reduced, guides stationed at cross roads to prevent the wrong route from being taken, strict march discipline maintained, and a moderate rate of march observed. Numerous connecting files should be provided. When practicable, night concentrations should be effected by motor transport. Daybreak should find the troops either in position or in concealed localities (woods, villages) and trains under cover.

In movement off roads, the route should be carefully laid out by compass bearings and the march directed by means of illuminated compasses.

In night marches where protection against the reconnaissance or attack of hostile airplanes making use of flares must be provided, special precautionary measures are necessary. The command should march in small units and avoid main routes, taking secondary routes as far as practicable. No assembly of troops should be permitted to take place at railway stations. When a unit is illuminated, it should stop, keep to the side of the road, and remain motionless.

21-4. Long night marches should be made only over well-defined routes. March discipline must be rigidly enforced. The troops should be marched in as compact a formation as practicable, with the usual covering detachments. Advance and rear guard distances should be greatly reduced. They are shortest when the mission is an offensive one. The connecting files are numerous.

The ground to be traversed should be reconnoitered by daylight, and if practicable, at night. Features that are distinguishable at night should be carefully noted, and their distances from the enemy, from the starting point of the troops, and from other important places should be made known.

The most favorable time for beginning the reconnaissance is shortly before dusk, so that both the day and night aspects of the terrain may be studied.

The approaches should be staked out as far as practicable or outlined by luminous tape.

Troops attacking at night can advance close to the enemy in compact formations and without suffering loss from hostile artillery or infantry fire. The defender is ignorant of the strength or direction of the attack.

A force which makes a vigorous bayonet charge in the dark will often throw a much larger force into disorder.

A night advance made with a view to making an *attack* in the course of the following day usually terminates with the hasty construction of entrenchments in the dark. Such an advance should be so timed as to allow an hour or more of darkness for entrenching.

An advance that is to terminate in an *assault* at the *break of day* should be so timed that the troops will not arrive long before the assault is to be made; otherwise the advantage of surprise will be lost, and the enemy will be allowed to reinforce the threatened point.

21–5. A night attack may be delivered with a view to carrying important points necessary for the offensive of the following day or to the driving in of outposts. In the pursuit of a defeated force which seeks to cover its withdrawal by weak forces heavily equipped with machine guns, a night advance will often offer a means of avoiding the disproportionate losses incident to a daylight advance, and permit the attacker to close with the retreating force.

The time of night at which the attack should be made depends upon the object sought. If a decisive attack is intended, it will generally yield the best results if made shortly before daybreak with a view to following up immediately the success obtained and exploiting to the maximum the effect of surprise. If the object is merely to gain an entrenched position for further operations, an earlier hour is necessary in order that the position gained may be entrenched under the cover of darkness. Moonlight is especially favorable to a night attack, as it greatly facilitates movement without materially increasing the efficiency of fire.

Orders must be formulated with great care and clearness. Each unit must be given a definite objective and direction, and care must be exercised to avoid collision between units. A distinctive badge (e. g., white arm band) should be worn. The conduct to be observed by each unit on carrying its objective should be prescribed.

Preparations must be made with secrecy, with a view to effecting as complete a surprise as possible. All possible precautions are taken; arms and equipment are secured so as to make no noise; silence is strictly enforced; the use of whistles is prohibited; orders are transmitted by agents in a low tone. Bayonets are fixed but pieces are not, as a rule, loaded.

When the movement is started, and not until then, men should be acquainted with the general design, the composition of the whole force, and should be given such additional information as will insure cooperation and eliminate mistakes.

During the movement every precaution must be taken to keep secret the fact that troops are abroad.

Unfriendly guides must frequently be impressed. These should be secured against escape, outcry, or deception.

An attack once begun must be carried to its conclusion, even if the surprise is not as complete as was planned or anticipated.

21–6. The formation for attack must be simple. It should be carefully effected and the troops verified at a safe distance from the enemy. The attacking troops should be formed in compact lines and with strong supports at short distances. The reserve should be far enough in rear to avoid being drawn into the action until the commander so desires.

Darkness causes fire to be wild and ineffective. The attacking troops should march steadily on the enemy without firing, but should be prepared and determined to fight vigorously with the bayonet.

In advancing to the attack the aim should be to get as close as possible to the enemy before being discovered, then to trust to the bayonet.

Units are usually formed for attack in small columns (sections or squads). In each platoon, these columns are usually formed in depth, each being assigned the same objective and following the same route. They should follow one another at such distance (about 50 yards) that no two will be caught in the same ambush. The leading unit of each column acts as a covering detachment; it is usually preceded by two or three scouts. The advance will usually be effected by short bounds; at each halt, scouts reconnoiter for the next advance. Halts should be of the shortest possible duration; rapidity is an essential element of the success of a night attack. As soon as a hostile post is discovered, it is rushed with fixed bayonets. If the advanced element falls into an ambush, the rearward columns move out toward the flank and endeavor to pass it. If this is impracticable, they rush the hostile resistance without hesitation; delay after the attack is discovered is fatal.

In all cases the attack is carried out with the bayonet without firing.

After each attack, the unit engaged is re-formed before initiating a further advance.

Immediately after the capture of the objective, the position must be rapidly organized with a view to checking counterattacks.

In position warfare, the intensified organization of obstacles and machine-gun defense usually limits night attacks to raids by small units.

21–7. The principal means of defense against night attack are:

(*a*) The fire of fixed weapons and grenades.
(*b*) Obstacles.
(*c*) Illumination of the foreground.
(*d*) Counterattack.
(*e*) Patrols and outguards.

21–8. On the defense, preparations to resist night attacks should be made by daylight whenever such attacks are to be feared.

Obstacles placed in front of a defensive position are especially valuable to the defense at night. Many forms of obstacles which would give an attacker little concern in the daytime become serious hindrances at night.

After dark strong patrols should be pushed to the front.

These defensive elements are so combined as to take the attacking forces by surprise. Ambushes are created by constructing obstacles along the most probable lines of hostile advance (roads, paths, etc.), and these are swept by the fires of fixed weapons sited to a flank or to the rear. The obstacles should be so concealed that the enemy will not discover them before falling into them. While the attacker is held up in front of the obstacle, the fixed weapons open a heavy fire with a view to checking his advance and giving the alarm to troops in rear. The latter at once advance to counterattack with the bayonet in such manner, if practicable, as to take the attacking troops in flank. Supports and reserves should be posted with this object in view or with a view to recapturing the position if lost. The distance of supports and reserves should be greatly reduced. Outguards provide for the security of the command, when practicable, they prepare ambushes in advanced positions with a view to breaking up an attack before it reaches the defensive position or to capturing hostile patrols.

The use of star shells is most important in disclosing the position of hostile troops. When employed they must be projected behind the enemy's line, otherwise they mask his movements and make him invisible to the defenders.

In the use of artificial illumination, care must be taken that the location of the defensive position is not revealed.

Especial vigilance must be maintained shortly before daybreak and on moonlight nights.

Reserve units must be able to form rapidly at designated assembly positions and proceed therefrom along previously reconnoitered routes to any part of the front where they may have to intervene.

When it is learned that the enemy is approaching, the trenches are filled and the supports moved close to the firing line.

Supports fix bayonets, but do not load. Whenever practicable and necessary they should be used for counterattacks, preferably against a hostile flank.

The defender should open fire as soon as results may be expected. This fire may avert or postpone the bayonet combat, and it warns all supporting troops. It is not likely that fire alone can stop the attack. The defender must be resolved to fight with the bayonet.

Ordinarily fire will not be effective at ranges exceeding 50 yards.

A white rag around the muzzle of the rifle will assist in sighting the piece when the front sight is not visible.

21–9. Offensive and defensive night operations should be practiced frequently in order that troops may learn to cover ground in the dark and arrive at a destination quietly and in good order, and in order to train officers in the necessary preparation and reconnaissance.

Troops should be trained in the necessary details (night movements, night patrolling, night marching, and communication at night, see arts. 20–35 to 20–47).

Only well trained, thoroughly disciplined troops should be employed in a night attack.

Poorly disciplined and untrained troops are unfit for night attacks or for night operations demanding the exercise of skill and care.

Section II.—COMBAT IN WOODS

21–10. Combat in woods partakes in a lesser degree of many of the characteristics of night combat. These are: decrease in the effectiveness of fire; increase in the importance of close combat and surprise; difficulty in the maintenance of

direction, communication, and cohesion of the troops; effectiveness of ambushes; ineffectiveness of aerial observation.

Woods lend themselves to gas concentrations.

They are especially favorable to delaying actions by relatively small forces. They keep the attacker in ignorance of the strength of the forces confronting him.

21–11. The attack of a woods comprises four general phases:

(*a*) The preliminary artillery bombardment.

(*b*) The advance over open ground to the edge of the woods;

(*c*) The advance through the woods;

(*d*) Egress from the woods.

21–12. Small woods are favorable targets for artillery fire and should be subjected to a preliminary bombardment before attacking by infantry. If tanks are available they can be used most effectively to break down machine-gun nests about the edges of the woods previous to or in conjunction with the infantry attack.

21–13. The main general feature of the situation during the advance over open ground to the edge of the woods lies in the fact that the defender sees all the movements of the advancing troops while his own position is concealed. When wind and atmospheric conditions are favorable, this advantage may be neutralized by the use of smoke screens; or the approach to the edge of the woods may be effected at night.

21–14. The edge of the woods should be carried like any other position and employed as a departure position from which the advance through the woods is organized and launched. If the attacker attempts to advance uninterruptedly through the woods without reorganizing at the edge of the woods, great inequality in the advance of different parts of the line will unavoidably result, and the more advanced elements will be exposed to being taken in flank by the prepared ambushes of the defense.

21–15. In general, the advance through the woods should be methodically organized with a view to maintaining cohesion between the attacking units. The movements should be effected in a series of bounds, with halts to restore contact and cohesion either on certain predetermined lines or at prescribed periods. Paths or roads perpendicular to the line of advance are especially useful for this purpose.

Direction must be carefully maintained by means of compass bearings.

Especial measures for maintaining contact with units advancing on the flank outside the woods must be taken (strong combat patrols with machine guns).

21–16. The formation to be adopted depends upon the density of the woods. In sparse woods, formations resembling those employed on open ground (close line of skirmishers) are generally most suitably the leading elements. In dense woods, the conditions more closely resemble those of night operations, and similar formations will be most effective (section or squad columns disposed in depth and preceded by scouts). Supports should closely follow the assaulting units. Connecting files maintain contact between adjacent columns and between rearward and leading units.

21–17. Absolute silence must be maintained throughout the advance. Sound signals must as a rule be prohibited. When necessary, the line is marked for airplanes by Bengal flares. Rocket signals are used to indicate arrival on important terrain lines.

21–18. The rate of the advance depends largely upon necessity for reconnaissance and other security measures, and is necessarily slower than on open ground.

Scouts reconnoiter to the front and flanks of the advancing columns, remaining within sight of their units. As soon as the scouts have indicated that all is clear, the platoon or section advances, and the scouts move forward for further reconnaissance. If the scouts discover a hostile post, the leading columns rapidly form skirmish line facing it, and the post is rushed without hesitation. Rearward columns move to one side of the line of advance with a view to taking the hostile resistance in flank or checking a counterattack against the flanks of the leading columns.

21–19. Especial care must be taken when scouts discover an obstacle across the line of advance. Reconnaissance toward the front and flanks must be carried out with a view to the discovery of any hostile post located with a view to sweeping the obstacle with frontal or flanking fire.

21–20. Especial provision for the protection of its flanks must be made by any unit which advances so far beyond adjacent units that its flanks are unsup-

ported. Reconnaissance must be pushed sufficiently toward the flanks to insure that the advancing columns will not be taken under flanking fire.

21-21. Special precautions must be taken before debouching in clearings or on wide roads.

When advancing along a road or path, the leading columns should halt at all turns until the reconnaissance of scouts has progressed sufficiently to insure the safety of the column.

21-22. Before debouching from the far edge of the woods, the columns should halt and re-form far enough within the interior of the woods to be beyond the enemy's view. The position to be occupied after debouching should be reconnoitered. Machine guns and accompanying weapons should be brought up and posted so as to cover the egress. If the situation is such that heavy fire from hostile artillery registered on the edge of the woods may be expected as soon as the units commence to debouch, the movement should be carried out in a single rush and by surprise. When greater danger is to be apprehended from close combat weapons than from artillery, the egress may be effected by infiltration; automatic riflemen rapidly build up a thin line on the new position, and under the cover of their fire, the rest of the units forms up on the new position.

21-23. The method of defense in woods are similar to those in night defense.

The defense aims to take the attacking units under flanking fire and by surprise. It therefore makes extensive employment of prepared ambushes. By the establishment of carefully concealed strong points and obstacles at intervals along the front in the interior of the woods, it endeavors to break up the continuity of the attacking line. Ambushes, echeloned to the rear of the strong points, are so established as to take under flanking fire hostile elements penetrating through the intervals between the strong points. Obstacles are constructed in rear of the intervals in such manner as to hold the penetrating elements under the fire of the troops in ambush. Supports and reserves are so posted as to take in flank by counter attack hostile elements held up in front of the strong points or penetrating through the intervals. Roads and paths are swept by the fire of machine guns and automatic rifles.

21-24. The advanced line of strong points should be established at a short distance from the edge of the woods. Tiers of fire may be created and the field of fire extended by posting sharpshooters and machine guns in trees. Arrangements for flanking the edge of the woods should be made. The defense of clearings is similarly organized.

21-25. Sound signals are employed by the defense to give warning of the enemy's approach.

21-26. Woods are especially favorable to covering a withdrawal as they force the pursuer to a deliberate advance. A weak rear guard can delay the advance of large hostile forces until the main body has withdrawn beyond reach of pursuit. By its movement in withdrawal a skillfully handled rear guard can often attract the enemy in a direction favorable to counterattack.

21-27. Troops must be carefully trained in the maintenance of direction in woods. Exercises in which widely separated units are assigned a common rendezvous at the far edge of the woods should be held for training in keeping direction by compass bearings.

Section III.—WITHDRAWAL

(See Army Combat Principles, Part III, rifle squad, par. 12; rifle section, par. 19; rifle platoon, par. 28; machine-gun section, pars. 25 and 26; machine-gun platoon pars. 41-44; machine-gun company, pars. 71-89)

21-28. When it is no longer possible to give the action a favorable turn and the necessity for withdrawal arises, every effort must be made to place distance and a rear guard between the enemy and the defeated troops.

21-29. A withdrawal by daylight involves such heavy losses and so great a degree of disorganization that it is as a rule preferable to hold out at all cost until nightfall and effect the withdrawal under the cover of night. Rearward echelons only can as a rule be withdrawn by day.

Any order for withdrawal from an uncertain source must be disregarded. Orders for withdrawal are especially suspicious when passed along a line of skirmishers.

21-30. If an intact reserve remains it should be placed in a covering position, preferably on a flank, to check the pursuit and thus enable the defeated troops to withdraw beyond reach of hostile fire.

21–31. The steps involved in withdrawal are in general:

(*a*) Selection of a covering position for supports and reserves.

(*b*) Selection of an assembly position where the several units will assemble when withdrawn and form in column of route; or of a defensive line on which resistance will be renewed.

(*c*) Withdrawal of transportation and evacuation of such stores as can be removed and destruction of unremovable supplies.

(*d*) Withdrawal of rearward echelons (supports and reserves) to the covering position.

(*e*) Withdrawal of the combat echelon.

21–32. If the general line is divided, by terrain or by organization, into two or more parts, the firing line of the part in the least danger from pursuit should be withdrawn first. A continuous firing line, whose parts are dependent upon one another for fire support should be withdrawn as a whole, retiring by echelon at the beginning of the withdrawal.

21–33. When the withdrawal takes place by day, troops in the first line are withdrawn by successive echelons and placed in reserve as soon as the supports and reserves have occupied the covering position. The fire of the echelons remaining in position, the overhead fire of machine guns and artillery, and the use of smoke screens are the most effective means of covering the movement of the withdrawing troops.

21–34. When withdrawal is effected at night, supports, reserves, and the greater part of the combat echelon are successively withdrawn to the covering or the assembly position. The front lines are held by weak elements, which by simulating great activity (heavy firing from different positions, reconnaissances of strong combat patrols, numerous flares and rockets), endeavor to create the impression of heavily held lines. These advanced elements are withdrawn toward daybreak, leaving the position vacant.

The movement in withdrawal takes place in small columns (sections or platoons) which pass the covering position and move toward the designated rendezvous. Platoon and company organization should be restored during the movement so that battalions will be well in hand on reaching the assembly position.

21–35. The covering position should be far enough to the rear to prevent the troops occupying it from being influenced by the withdrawal but sufficiently near to exert an influence on the action as soon as the withdrawal begins (1,000–3,000 yards). It should give the covering troops a good field of fire at mid and long ranges and should facilitate their own safe and timely withdrawal. The selection of other successive covering positions in rear of the first may become necessary.

21–36. The route to be followed by each unit in reaching the assembly position should be prescribed. Guides should be furnished when necessary.

21–37. Routes must be cleared by the timely movement of all transportation.

21–38. The strength of the troops on the covering position should be as small as possible. They should be plentifully supplied with machine guns and infantry guns (artillery pieces). These remain in position until the last moment, if necessary; the infantry guns fire over open sights against the advancing enemy.

21–39. The assembly position should be far enough to the rear to enable the advanced lines to free themselves completely from contact with the enemy and insure sufficient time for undisturbed reorganization. When practicable, this position should be protected by natural obstacles, such as woods, watercourses, etc. The position should be selected with regard to the routes leading to the rear.

21–40. A step-by-step opposition to the enemy's pursuit, by taking up and holding successively covering positions to the rear of the main position can not be continued long without involving an excessive number of troops and increasing the demoralization of the entire force. The number of covering positions taken up in the immediate vicinity of the battle field must be reduced to a minimum by organizing the retreat and forming a rear guard as soon as possible after the decision to retreat has been reached.

21–41. The commander of the whole, having given orders for withdrawal, should go to the rear, select a rendezvous point, and devote himself to the reorganization of his command.

The rendezvous point is selected with regard to the natural channels of movement approximately straight to the rear. It should be distant from the battle field and should facilitate the gathering and protection of the command.

21–42. In small units, a limited withdrawal may sometimes be effectively employed as a means of drawing a pursuing enemy in a direction such that he will come under heavy flanking fire or expose himself to being counterattacked from the flank.

Section IV.—MINOR OPERATIONS

21–43. Minor warfare embraces both regular and irregular operations.

Regular operations consist of minor actions involving small bodies of trained and organized troops on both sides.

The strategy of small wars may be divided into six general steps:

(1) Seizure of ports or border towns commanding routes of trade or entrance.

(2) Seizure of interior cities commanding the resources of the territory and the establishment therein (or at other suitable points) of bases of supply.

(3) The division of the theater of operations into military districts.

(4) Operations based on a captured city or fortified base of supplies against the remaining opposition.

(5) Seizure of livestock and supplies.

(6) Seizure of all arms.

The tactics employed are, in general, those prescribed for the smaller units.

21–44. Irregular operations consist of actions against unorganized or partially organized forces, acting in independent or semiindependent bodies. Such bodies have little or only crude training and are under nominal and loose leadership and control. They assemble, roam about, and disperse at will. They endeavor to win by stealth or by force of superior numbers, employing ambuscades, sudden dashes or rushes, and hand-to-hand fighting.

Troops operating against such an enemy usually do so in small units, such as platoons, detachments, or companies, and the tactics employed must be adapted to meet the requirements of the situation. Frequently the enemy's own methods may be employed to advantage.

In general, such operations should not be undertaken hastily; every preparation should be made to strike suddenly and to inflict the maximum punishment.

In general, the service of information will be insufficient; adequate reconnaissance will rarely be practicable. March and bivouac formations must be such as to admit of rapid deployment and fire action in any direction.

21–45. In the open country, where surprise is not probable, troops may be marched in column of squads preceded, within sight, by a squad as an advance party.

21–46. In close country, where surprise is possible, the troops must be held in close formation. The use of flank patrols becomes difficult. Occasionally an advance party—never less than a squad—may be sent out. In general, however, such a party accomplishes little, since an enemy intent on surprise will permit it to pass unmolested and will fall upon the main body.

Under such conditions, especially when the road or trail is narrow, the column of twos or files is a convenient formation, the officers placing themselves in the column so as to divide it into nearly equal parts. If rushed from a flank, such a column will be in readiness to face and fire toward either or both flanks, the ranks being back to back; if rushed from the front, the head of the column may be deployed, the rest of the column closing up to support it and to protect its flanks and rear. In any event, the men should be taught to take some form of a closed back-to-back formation.

21–47. The column may often be broken into two or more approximately equal detachments separated on the march by distances of 50 to 100 yards. As a rule, the detachments should not consist of less than 25 men each. With this arrangement of the column, it will rarely be possible for an enemy to close simultaneously with all the detachments, one or more being left unengaged and under control to support those engaged or to inflict severe punishment upon the enemy when he is repulsed.

21–48. The site for camp or bivouac should be selected with special reference to economical and effective protection against surprise. Double sentinels are posted on the avenues of approach and the troops sleep in readiness for instant action. When practicable, troops should be instructed in advance as to what they are to do in case of attack at night.

21–49. Night operations are frequently advisable. With the small forces employed, control is not difficult. Irregular troops rarely provide proper camp protection, and they may frequently be surprised and severely punished by a properly conducted night march and attack.

Section V.—STREET FIGHTING—OCCUPATION OF CITIES

General Statement

21–50. Landing and expeditionary operations in the naval service partake largely of the nature of minor warfare. The opposing forces are usually poorly organized, with little or no artillery, and their plan of campaign consists largely in the attack and defense of cities. The loss of a city hurts the prestige of the hostile people and the morale of their troops more than the losses of battle.

In this method of warfare the cities are, according to old-time principles, defended as strongholds, and all available features are utilized as a means of prolonging the defense. Therefore, street, house, and roof fighting by organized and unorganized bodies may be expected in the occupation of any city. Sniping from roof tops, cellars, etc., is used, especially after the organized forces have been dislodged and the victorious troops are spread out in occupying the town.

21–51. With a large organized force the enemy will naturally make his primary defensive stands either on some prominent and suitable terrain in the vicinity of the town, or at its outer edge. Attacks on such positions are governed by the principles of modern tactics and need no consideration here. The ultimate line or period of defense will consist in the house-to-house fighting mentioned above and is the subject matter considered herein. The principles of street fighting herein described, while especially applicable in the above cases, may often be employed with advantage in any hostile country, or on riot duty. (See Defense of Towns and Villages, art. 22–58.)

General Principles and Objective

21–52. Success in the primary engagement on the outskirts of the city will be brought about through the usual influences of an enveloping or turning movement. The defenders may be quickly dislodged from their position by such tactics and, in general, will follow one or two courses or a combination of both. They may withdraw beyond the town to some other city and leave the interior defense to the inhabitants, or they may join the inhabitants in the latter action; or, especially in case of a rout, they may divide and follow both lines of action. In any case the victors will find opposition, organized and unorganized, within the city proper.

21–53. In addition to resistance by organized troops, and even when this is lacking, resistance may be looked for from the populace; principally, of course, from more adventurous spirits—youths, the tough characters who, besides being easily inflamed by low-class leaders, hope to plunder and loot in the confusion and disorder. The police may be expected to join in the resistance. A certain percentage of the better class of citizens will be found willing to risk their lives and property by sniping at our troops.

21–54. It is often the custom to keep arms concealed in dwellings and places of business. In view of this custom, it is necessary, in taking a city, to secure all the arms possible from the inhabitants at the very beginning; otherwise sniping will occur for days after the occupation, and restoration of order will be considerably delayed. A thorough search of every building is requisite. The search should be carried out during the advance or it will have to be done afterwards, spasmodically, at considerable inconvenience, creating friction and lessening the tranquillity and confidence of the populace.

21–55. Organized firing ceases following the occupation of a town and the withdrawal and dispersion of the enemy. But isolated groups and individuals, well armed, remain on housetops, in towers, and in concealment. These snipers, without definite cooperation, but upon every favorable opportunity, open an exceedingly dangerous fire, difficult to locate or return. Unless promptly and effectually cleared out, this class causes continued annoyance and many casualties. Delivered with extreme deliberation and in almost perfect safety and concealment, the fire of snipers is peculiarly dangerous to patrols and sentinels, and prompt and vigorous measures are necessary to protect the occupying troops.

21–56. **Disposition.** To meet such situations, if the strength of the command will permit, two forces having separate and distinct duties must be organized. The size of these forces is dependent on the numbers engaged and the line of action followed by the unsuccessful defenders. The first or covering force is for the purpose of pursuit, observation on the farther edge of town, surrounding the town, etc. This force will gain its proper position with the least loss of men and time by skirting the town, thus avoiding street fighting. There will be many cases where lack of troops or other reasons make it inadvisable to provide

a covering force. Whenever such a force is employed, care must be exercised to so use it as not to interfere with, or endanger by its fire, the occupying force. The other force is for the purpose of clearing and occupying the town proper and is the one to be specially considered.

21–57. The **covering force** acts according to the special situation presented, and adopts the methods best suited to each case in accordance with recognized tactical principles. The **occupying force** has a duty to perform which calls for the methodical use of the troops in accordance with a prearranged and well-understood system. The system must be prescribed in detail and all men instructed in its essential features. If the system is well understood and strictly adhered to, a saving of life will result, as the work will be done thoroughly and instances of friendly troops firing into each other will be avoided. A definite and rigid system for this class of work has no more relation to normal formations than fixed methods of company deployment have to normal formations for attack. A system once devised may be employed as circumstances demand, since the adoption of a fixed system limits in no manner the method of its employment. With adherence to a definite system by the smaller organizations their part in the teamwork and cooperation will be assured, Without a fixed method these smaller units will be prompted mainly by a desire to be first at the principal points and the work will not be thoroughly done. The objective is, of course, the complete occupation of the town and subjugation of its inhabitants. Depending on the resistance encountered, this involves a slow, deliberate advance coupled with a careful house to house search for arms.

21–58. **Architecture and general characteristics.** Cities or towns which from their solid construction are most apt to be used as strongholds, and in which street fighting is likely to be encountered, often have the following characteristics:

1. An approach to a rectangular arrangement of streets.
2. A system of building construction characterized by rather narrow streets, thick masonry or mud building walls set close to the sidewalks and without intervals between buildings, flat roofs usually intercommunicating in the same block and frequently having copings which afford cover from fire, large windows and doors, frequently barred, interior courtyards through which all or nearly all houses in a block may be entered from the rear, and means for reaching roofs by trap doors. Cellars with apertures opening on the street are also found.
3. Several large public buildings, in addition to barracks or forts, from which resistance may be expected.
4. Large churches of massive construction from which resistance is likely.
5. A sprinkling of towers on churches, on public buildings and sometimes on dwelling houses, from which rifle fire and even machine-gun fire may be directed—these towers always command a number of neighboring roofs.
6. One or more public squares about which some of the most important buildings are located and about which resistance is likely to center.
7. In the larger and more up-to-date cities may be found several buildings, such as hotels and office buildings, with some modern improvements, usually under foreign control and occupation, and usually two or three stories higher than other buildings in the city.
8. There may exist some cities of circular shape, but these are the exception—their characteristics as to construction are similar to the foregoing.
9. On the outskirts of the cities are frequently found cemeteries and chapels surrounded by stone walls with defensive value.

Action of Occupying Force

PRELIMINARY ARRANGEMENTS

21–59. Reconnaissance.—If plans of the city or town to be occupied are not available, a hasty reconnaissance should precede the issuance of orders for the occupation. This reconnaissance is for the purpose of gaining general direction of the main streets and information as to special localities, such as public squares, barracks, etc., where serious opposition may be expected. If an old map is used, troops should be cautioned to locate the streets assigned them by their positions on the map and not to be misled by a different name on the street corner, as street names are often changed. A great deal of important data may be gathered by the troops during any preliminary engagement on the outskirts of the town. Officers and men should be impressed with the importance of this information and be required to furnish it to the proper officer. In order to insure thor-

oughness and cooperation, the foregoing information is essential in prescribing the duties of the occupying troops.

21–60. The occupying force may be able to carry out its function while the covering force is en route. Except in the case of small villages and unless the time element demands such action, it is often better to utilize the occupying force, during the preliminary stages, in keeping the enemy engaged on the near edge of town and in performing the reconnaissance mentioned above. A friendly force on the farther edge of town, properly handled, will facilitate immensely the work of the occupying force.

21–61. Direction of advance.—The selection of a desirable side of the town through which the troops will make their first entrance is not always practicable. The deployment for an attack of a position outside of the town and the resulting practical dispositions of the troops may prohibit the selection of any special side. In any case the following principle must be adhered to as far as practicable: Select and order a line of advance, whether along streets or through buildings, which will guarantee the movement of all troops in the same direction. This is essential in order to avoid a convergence which might result both in interchange of fire between our troops and in failure to cover some parts of the town. This is a less difficult procedure in rectangular-shaped towns than in the circular or irregular forms. In the latter case the method of following along fixed lines, determined by designated features of the town, such as church steeples, must be carried out, whether the designated lines follow streets or go through buildings and courtyards.

21–62. Orders.—The orders for the occupation should include the plan of action of the whole command, the general direction of the advance, a division of the town into sections and the assignment of troops to each section, the retention of a reserve, the protection of the flanks, the disposition of prisoners and of the arms found, the use of artillery, and any special features.

21–63. Sections and assignments of troops.—The division lines of the sections should be in the direction of the advance and not at right angles therein. The sections should be from one side of the town straight through to the other side. This may necessitate long, narrow sections, but it will insure unity of command and avoid confusion. Main streets should not be selected for section lines, as a division of authority at such points is undesirable. If the street can not be definitely described and used for this purpose, conspicuous features of the town coupled with compass directions will answer.

The width of a section to be assigned to any organization is governed not only by the amount of opposition but also by the depth of the section. It must be remembered that the whole occupying force can not move from one edge of the town to the other. As the advance continues, detachments must be left behind to guard that part of the town passed through. The depth is fixed, as the section should run straight through the entire town, and upon this factor depends the width assigned to any organizations. For instance, if the depth of the town in the direction of the advance averages 2 miles, a battalion should not ordinarily be assigned a width of more than two streets, i. e., one block and one-half of the adjacent blocks. In section assignments streets should be inclusive or exclusive. No method of assignment should be used which divides the authority on any particular street.

Each regiment should be assigned a definite section and in turn should assign certain parts of its section to its battalions. These divisions and subdivisions should follow the principle of having sections which will extend straight through the town. The battalion should be the basic unit of assignment and execution of the work.

21–64. Artillery, mounted detachment, and pioneers.—The terrain surrounding the town may afford suitable positions from which artillery and machine-gun fire can be directed over the troops against such places as towers, churches, and other prominent defensive buildings. Intercommunication between the commanders of the occupying troops and the artillery will permit such use of the latter arm. If the occupation is protected by the guns of the fleet, so much the better. A good system of communication is essential.

A mounted force will be best used with the covering force for flank protection and observation on the farther edge of the town. Cavalry should not be used in street fighting if other troops are available; but if used, it fights dismounted.

Pioneers may be valuable in demolition work. If no special function exists for these troops, detachments equipped with explosives should be assigned to each infantry regiment. It will be advisable in many cases to assign to each infantry battalion a detachment of pioneers equipped for escalade. Also in

some cases detachments equipped for fire fighting should be attached to the reserve of the occupying force.

21-65. **Reserves.**—The retention of general and local reserves will be governed entirely by the tactical situation. The necessity for flank protection, the possibility of serious encounters in barricaded streets, interior forts, and defensive areas should be considered in this connection. With a covering force on the flanks and on the farther edge of town, little necessity for more than a small reserve will exist.

The Details of Occupation

SPECIFIC DUTIES, SECTION ASSIGNMENTS, AND DISTRIBUTION OF TROOPS

21-66. As stated in the foregoing, the battalion should be regarded as the working unit and the basis of sectional assignments. Its duties include:

1. The clearing away of all opposition.
2. Searching for arms.
3. Collection of arms.
4. Providing a temporary guard for the occupied section until relieved by a provost guard.

21-67. The division of the battalion for the performance of the foregoing duties is similar to its tactical formation for attack. The strength of its subdivisions is governed by combat principles. The duty of clearing away all opposition and the search for arms is performed by the firing line. The collection of arms, the supply of the guard, and any reinforcing for the firing line is performed by the battalion support.

21-68. The units designated for the firing line should be assigned definite subsections and be directed to cooperate in the advance and the duties incident thereto. In the assignment of sections to battalions and of subsections within the battalions streets must not be specified as boundaries between sections or subsections. As a rule the boundaries will be the median line halfway between streets. If a battalion has a single street assigned it, its section will extend to the middle of the block on each side, and there will be no subsections. If it has two or more streets assigned, there will be subsections for each street.

21-69. **The firing line.**—The firing line furnishes no guards. It continues its advance through the town. The senior officer of the firing line commands the same and regulates its advance, which should be simultaneous, block by block. No part of the firing line should advance beyond a block without the above officer's authority.

In performing its duties the firing line may advance along the streets or through the buildings and yards adjoining. Each method has disadvantages; the former presents a more favorable target to the snipers, while the latter permits the men to get out of hand, leads to confusion and incompleteness of the work. Both methods may have to be used, especially in circular or irregular shaped towns. Where practicable, the street system is deemed best.

In dividing the section among the troops of the firing line, a prerequisite is to have an officer in charge of each street. The strength assigned to each street will vary in proportion to the depth and width of the section and the size of the companies. Platoons and even half platoons may be sufficient in some cases. Still the company as a whole should remain under the c. c.'s control and assignments arranged with this in view.

21-70. Each force assigned to any street should be organized into a **main body, street detachment, roof detachment,** and a **searching detachment.** The strength of the detachment will depend upon the opposition encountered and the amount of work required by them. Generally one or two squads are sufficient for each detachment.

21-71. The **street detachment** operates along the street and in advance of the **searching detachment.** It clears away all opposition in the street, in windows, doors, and window porches. It advances from one cross street to the rear side of the next and then awaits orders. The advance is made with a column of files on each side of the street, such cover as is afforded by doors and windows being utilized. The men on one side of the street should be charged with responding to any hostile fire delivered from upper windows and roofs on the other side. When the next cross street is reached the detachment does not cross it but responds from concealed positions to any hostile fire delivered from the adjacent block on the cross street. This action, combined with that of the **roof detachments,** should clear out any opposition on the cross street.

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Armored cars, or motor trucks hastily converted by covering with sheet metal, are excellent to precede the street detachments for breaking down resistance. These cars will prove especially useful later in mopping up and patroling.

21–72. After opposition on the cross street is disposed of and the **roof detachment** of the same organization has reached the tops of the houses at the near side of the cross street, word is sent to the officer commanding the street. After the **searching department** has completed its work, he has a flag or handkerchief raised in the cross street to indicate his readiness for a new advance.

The commander of the firing line, after assuring himself of the readiness of all troops, signals, by his whistle, for the entrance into the next block, which should be made simultaneously by the whole line.

21–73. The **roof detachment** should be under charge of an officer or experienced p. o.; it is divided into sections, one for each side of the street. These sections gain the roofs at once and gradually advance, as far as practicable, from roof to roof, until the last roof of the block is reached. From this point the detachment disposes of any opposition located on roofs or in houses on the opposite side of the cross street or down the street it is operating on. The fire of this detachment must be directed to its front. Flank and cross fire would endanger friendly troops. The detachment remains on the roofs of the houses on the near side of the cross street until a new roof detachment has gained the roofs of the houses on the far side. When this action is about to be taken the old roof detachment should be so informed. The old roof detachment joins its main body when the new (advance) roof detachment is in place.

Airplanes, when present, are excellent for spotting and reporting enemy roof firing detachments.

21–74. The **searching detachment** works in as many groups as practicable, designated as needed by the officer in command of the street. These parties systematically search every building and courtyard and every room in every building of its half of the block. The search must be very thorough and probable hiding places examined. The principal object of this slow and deliberate occupation of the town is to secure all arms during the first stages of the occupancy, and thus prevent sniping and disturbances later on. The importance of this work must be impressed on the men. All arms and ammunition found by the detachment are placed in the street in one pile for each block. As explained later, these are cared for by the support.

After the searching detachment has completed its work in the block and joined the street detachment, the officer in command should have a check made to discover losses. The signal of readiness for the next advance can then be given.

When rioters are found strongly fortified in certain sections of the city, these sections need not be attacked immediately but should be segregated as effectively as possible. In due time the resistance is resolved down to these isolated quarters.

21–75.—The **main body** of the street force is utilized to reinforce the **street** and **searching detachments.** This force is held under cover of a cross street until the next cross street is cleared when, by a rapid advance, it gains the cover of that street. New roof detachments are then made for the next advance.

21–76.—**The battalion support.**—The battalion support performs the triple function of collecting the arms, reinforcing the firing line, and furnishing the guards.

21–77.—**Medical Units.**—The company's hospital corps men should remain, as a general rule, with the main body of the street force.

The battalion surgeon, with battalion medical detachment should proceed with the battalion support, and establish a battalion dressing station if necessary.

The stretcher bearers shall be directed to take such station as may best enable them to evacuate the wounded to the battalion dressing station.

21–78. Special details should be made, under charge of an officer, for the collection of arms. Carts should be impressed and used for this purpose. The arms, piled in each block by the firing line, should be carted to some central place in the battalion section and held for orders from higher authority.

As the firing line clears out the various blocks, guards should be detailed from the support to observe this part of the district and to watch the arms until the collecting detail has taken them away. Guards should immediately inspect areas assigned them to see that no houses have been overlooked by the searching parties, or are occupied by dangerous persons after the passage of the searching parties. In some cases where resistance is particularly bitter, it may be necessary to evict all the inhabitants of some blocks, or even of an entire city; this duty will generally fall on the guards and not on the searching parties. By use of patrols, large areas may be covered.

The support, in one body, should follow the firing line at a suitable distance (two or three blocks). Connecting files for communication are kept on each street. The support may find frequent opportunity for a free advance on one street with the object of flanking the barricades on another. Communication should be maintained by the support with adjacent units and regimental headquarters.

21–79. **Machine guns.**—Machine guns are valuable in this work for flanking fire against barricades and to clear out streets and towers. Their mobility and inconspicuousness permits their use to advantage from windows and roofs at street corners and from towers.

They can not be allowed to advance or operate independently of the commanders of the firing line. Such action would endanger friendly troops and lead to a lack of coordination. It is better to assign them to battalions and have them operate under the battalion commander's orders at such places and times as he deems best.

21–80. **Useful adjuncts.**—The following tools and others which will suggest themselves can often be secured and used to advantage:

Shovels, flashlights, lanterns, crowbars, heavy sledge hammers, axes, pickaxes, saws, cold chisels, small ladders, tables, rope, railroad ties, rails, and large timbers for battering rams. Occasion may arise for the use of grenades, dynamite, and guncotton.

Section VI.—RIOT DUTY

21–81. Federal troops will be called on to perform riot duty, only where the disorder is serious and widespread, and the civil authorities and State troops are unable to handle the situation, or in case of national calamity, such as the Galveston flood or the San Francisco fire.

21–82. There is a marked distinction in the employment by a military commander of the forces under his command, on his own initiative, for aid in case of great national calamity, such as a fire, flood, or earthquake, and his employment of military force for the suppression of riot and disorder. In the first instance, troops can immediately be made available, if asked for, or if offered and accepted. In the case of riot and disorder, however, they can not be employed, except for the protection of Government property, until ordered out by proper Federal authority, by order of the President of the United States.

21–83. In case of wholesale and universal disorder in a town, city, or district, troops when properly ordered out will, in general, be required to carry out the tactics prescribed for the occupation of hostile towns and cities (arts. 21–50 to 21–80), or at least a modified form of these tactics. No exact rules can be prescribed; each case must be handled separately, and the severity of the measures and precautions taken to obtain the desired result should be so directed as to reestablish law and order in the shortest practicable time, with a minimum of violence and bloodshed.

21–84. A mob in the beginning is cowardly. Its individuals hesitate at open violations of the law, and are fearful of its consequences. Later the individual wills merge into the "mob will," unreasoning, impulsive; leaders spring up, and a spirit of daring and recklessness allays the individual's fear of consequences. When the mob has reached that stage, and especially after it has been successful in carrying out deeds of violence and crime, it becomes difficult to handle. In such cases it is folly to attempt to temporize or argue with them. Only firm measures properly applied with an adequate force will produce the desired results.

21–85. In the case of unlawful assemblies to be dispersed, warning must first be given by a civil officer, if one be available, otherwise by the commanding officer of troops. This warning cautions so-called innocent bystanders and curiosity mongers that their presence makes them equally guilty with the rest. They must be given a reasonable opportunity to get away.

21–86. The use of blank ammunition should never be permitted. Useless bloodshed will result because eventually ball cartridges will have to be employed. Troops must be kept well in hand and rigid fire discipline enforced. Expert shots are designated to fire when ordered. The shooting down of leaders and individuals who offer armed opposition, or who stone the troops, will produce a salutary effect, and will save the wholesale loss of life, certain to follow, if indiscriminate firing is permitted.

21–87. Troops will habitually work in detachments adequate to handle any situation which may confront them. Particular attention must be given to the service of security and information, and in the protection of the flanks.

Local reserves will generally be required. Avoid the danger of hand-to-hand clashes and close-in fighting. Here the mob, because of its superior numbers, has all of the advantage. The troops could, and probably would, be easily overpowered and disarmed. Keep the mob at such distance that the troops can employ their weapons, and use their training and discipline to the best advantage. The men must be made to understand that in dealing with citizens they must be most courteous, yet firm in carrying out their instructions; that they pay no attention whatever, nor appear to hear, insults or epithets from the crowd.

21–88. If the disorder is confined to a particular locality or district, this section must be segregated. All gatherings must be immediately broken up, and individuals on the streets be required to keep moving. The streets must be constantly covered by patrols, and supports established at proper points. Special guards will be established at plants or buildings which may become the object of the mob's activities. All bars and disorderly houses should be closed, and hardware stores containing firearms and ammunition must be closed and guarded.

Particular attention must be paid to the lighting system, telephone system, and water supply. Their sources and connections must be carefully guarded against interruption or destruction.

Fires must be particularly guarded against.

No person will be permitted to pass in or out of the disaffected district without proper authority.

21–89. An intelligence service will be established, and qualified civilians, or officers and petty officers, in civilian clothes, must be freely employed for obtaining all needed information. Activities in other parts of the city must be carefully watched and care must be taken to prevent such disorders, or meetings anywhere, as may tend to riot and disorder.

21–90. Press censorship may be required. Papers published or controlled by any of the disaffected parties will, in general, have to be censored. Parties responsible for a violation of the censorship will be punished, and a repetition of the offense by the paper concerned should result in its publication being suppressed during the period of the existing emergency.

It may here be stated and emphasized that where the disorders and riots are due to trouble between opposing factions (as in labor disputes), the attitude of the military authorities should be one of strict impartiality. The object of the military authorities is to reestablish law and good order and not to become partisans of any faction or organization, and this purpose should be clearly impressed on all concerned.

21–91. If the disorder be great and sniping against our men has occurred, all houses and persons in the disaffected district must be systematically searched for arms. In any event, all armed individuals of all factions must be disarmed. At night it may be necessary to enforce a curfew law, requiring all persons to be off the streets from an hour designated by the military commander. It may also be necessary to require all blinds and shades to be left open, and for all front rooms to be kept lighted during the night.

Section VII.—FIRE, FLOOD, AND NATIONAL DISASTER

21–92. The employment of the military forces in such cases as fire, flood, earthquake, and other national disasters differs from that prescribed to suppress riots and disorder. Depending on the extent of the disaster the military may be called upon to take complete control or merely to assist local authority. In cases of disaster the express order of the President of the United States is not necessary to secure the aid of the military and in such cases the military is subordinate to the local authority. Even if the local authorities have fled or been killed, the State authorities still exist and the greatest tact must be exercised by the commander of the relief forces in his dealings with civilians. The military forces will always cooperate with the local authorities and be assisted by the Red Cross and civilian relief organizations. In the event of foreign disasters, the situation may be handled by our own forces present, or by those of a combination of friendly nations until taken over by the forces of the nation concerned.

For administrative purposes the city should be divided into districts, and each district assigned to an organization. An inspection service of line, supply, and medical officers should be established from the main headquarters and district headquarters.

Troops may be safely employed as small detachments or as individual sentinels. Among the first steps to be taken are the guarding of Federal buildings, the banking district, and the prevention of looting. Ghouls and looters should be

dealt with summarily. In the event of a threatened food shortage, guards should be placed over food supplies in warehouses, wharves, railroad yards, and in transit through the city.

Working parties should be organized to succor the wounded and bury the dead. Civilians working in the ruins should be provided with distinguishing marks or brassards, and carry written authority. Saloons and liquor stores should be closed, and their stock destroyed if they persist in violating the order against the sale of liquor.

The water supply should be carefully tested and guarded against contamination. If the supply is in any way damaged, immediate steps should be taken for its early restoration.

Fire-fighting parties should be organized. If no water supply is available, the spread of the fire can be checked by demolitions and back fires. Explosives for demolition purposes should be of the kind that will not start fires upon detonation. Dynamite with an inert base is particularly suitable for this purpose. The specific sanction of the local authorities should be obtained, in writing if possible, before buildings are demolished. (For use of explosives to prevent the spread of fire and for the destruction of dangerous ruins, see Demolitions art. 22–64, et seq.)

Provision should be made to shelter and feed the homeless and destitute. All available tents should be erected in camps under military control. Proper camp sanitation is of vital importance. From past experience tents, ponchos, blankets, and shoes will be the principal articles required. [See United States Naval Regulations 83 (3).]

Military telegraph and telephone lines should be installed where required, principally to connect district command posts with headquarters. Radio communcation should be established as the situation requires and every effort made to reestablish outside commercial telegraph and telephone lines.

Issuing stations for rations should be established, under the most experienced help available. Whether or not it is possible or advisable to issue cooked food to civilians depends upon the situation. Past experience indicates that when uncooked rations are issued free, civilians tend to accumulate large quantities by "repeating." As soon as opportunity permits, establish means for keeping accurate account of all stores or meals issued to prevent such repetition as well as to insure a conservation of food supplies. When civilian restaurants are reopened, arrangements can be made to issue meal tickets at a low cost, or free of charge. Past experience has indicated that ration-issuing stations should be scattered over the city not more than a mile apart.

Transportation should be hired or obtained from volunteer offers; if unobtainable otherwise, it may be requisitioned, or seized.

The relief forces should include a medical detachment commensurate with the situation and forces available. This force should be composed of medical officers, hospital corps men with necessary medical supplies. All sanitary measures should be given wide publicity and strictly enforced. In this connection chapter 23, Medical Tactics Ashore, Field Hygiene, Sanitation and First Aid should be consulted.

Chapter 22

FIELD ENGINEERING

Section I.—FIELD FORTIFICATIONS

Definitions

22-1. Abattis.—An obstacle consisting of felled trees, often interlaced with wire. The trees are felled or placed with their tops toward the enemy.

Banquette.—The place upon which men stand to fire over a parapet. Usually called the **firing step.**

Berm.—A small place left between the parapet and excavations of a work.

Chevaux-de-frise.—An obstacle in the form of a saw horse with several legs.

Command.—The vertical height of the crest of a work above the natural surface of the ground or above the crest of another work.

Counterscarp.—The side of the ditch of a work farthest from the parapet.

Cover.—Protection from fire and view.

Crest.—The intersection of the interior and superior slopes of a parapet.

Ditch.—An excavation which is not intended for occupation. It serves as a source of supply of earth for the parapet, an obstacle to assault, or a means of drainage.

Enfilade.—Fire from the flank, parallel or nearly parallel to the line against which it is directed. It is particularly effective and demoralizing and is always carefully guarded against.

Exterior slope.—The outside slope of a parapet extending downward from the superior slope.

Fascine.—A long cylindrical bundle of brush used as a revetment.

Flanks.—The extremities of a defensive line and the ground in their vicinity.

Fortification.—Any engineering work or accessory device which increases the fighting power of troops by affording shelter or concealment or increases fire effect, or which restricts the tactical maneuvers or fire effect of the enemy.

Fortification, field or hasty.—Those works executed by combatant troops in the field to meet immediate tactical needs.

Fougasse.—A small land mine with a charge of explosives and broken stone. It is fired by powder fuse or electricity as the enemy approaches.

Gabion.—A hollow cylinder or brush or other material which is filled with earth and used as a revetment.

Head cover.—A vertical shield of any material which protects the heads of the troops from fire.

Hurdle.—A revetment of woven brush.

Interior slope.—The inner slope of a parapet extending from the crest to the banquette.

Listening posts.—Sheltered positions in advance of a defensive line for the purpose of early detection of the enemy's movements. They are connected with the main line by a communicating trench or subterranean gallery.

Loopholes.—Openings in a parapet or head cover through which fire is delivered.

Observation posts.—(See also listening posts.) Observation posts may also occupy commanding positions in rear of the firing line.

Obstacle.—Any device which retards the enemy's movements without affording him shelter from fire.

Overhead cover.—A horizontal or inclined shield of any material which extends over the heads of the troops and protects them from high angle fire.

Parados.—A bank of earth in rear of a trench to protect the occupants from the back draft of shells bursting behind the trench.

Parapet.—A bank of earth or other material in front of a trench or emplacement, which protects the occupants from fire.

Relief.—The vertical height of the crest of a work above the bottom of the ditch.

Revetment.—Any device used to hold earth or other material at a slope steeper than the natural slope.

Scarp.—The side of the ditch nearest the parapet. Also called **escarpe.**

Splinter proof.—A shelter similar to a bombproof, but designed to afford protection only against rifle bullets, shrapnel, and shell fragments. It is not proof against penetration by large projectiles.

Superior slope.—The top of a parapet immediately forward from the crest.

Traverse.—A bank of earth or other material in rear of and perpendicular to the parapet for the purpose of protecting the occupants from oblique or enfilade fire and to localize the effect of shells bursting in the trench.

Trenches.—An excavation which is for use either as a means of concealment, protection, or both. According to their use they are classified as **fire, support,** and **communicating trenches.**

Wire entanglements.—An obstacle of wire or barbed wire strung on posts or other supports; the most commonly employed obstacle.

General Principles[1]

22–2. **The purpose of field fortifications** is to increase the power of resistance of the troops occupying them by decreasing their exposure to the fire of the enemy and increasing the accuracy and volume of their own fire. They thus serve to hold the enemy in check and limit his power of maneuver. Furthermore, they accomplish this result with the least number of men, thereby rendering the greatest possible number available for aggressive concentration of superior forces at the critical points.

22–3. Even in a successful attack the assailant can not advance continuously. Halts will be necessary to permit of the bringing up of supplies and reenforcements, to refresh the troops, to hold the enemy in check, to select new points of attack, to readjust the artillery positions, etc. The assailant at all such halts must cling with the spade to that which he has won with the rifle or bayonet. Troops can not remain stationary upon the field of battle exposed to the fire of the modern rifle, machine gun, and artillery.

22–4. Fortifications, therefore, while **essentially defensive,** in their nature, will be extensively **employed also in the attack** The neglect to utilize them will involve heavy losses and, if opposed to a skillful adversary, will invite defeat. On the other hand, **their excessive and indiscriminate use** limits the mobility of the troops, tends to destroy the aggressive spirit which is essential to success, and surrenders the initiative to the enemy.

22–5. The technical details of the works themselves are comparatively simple and readily comprehended, but their location, arrangement, and adaptation to the tactical situation and to the terrain call for a high degree of skill.

22–6. In the early phases of the development of a defensive position, the first concern of the commander is to secure the key points on the line to be defended, the possession of which must be denied the enemy. The defensive line therefore, at first, is made up of a number of defensively organized areas, so located with respect to each other as to be able to support each other by cross-fire of small arms, and which, taken all together, form a line athwart the probable line of advance of the enemy.

22–7. These defensively organized areas are called **supporting points.** The garrison of a supporting point is preferably a tactical unit, and the supporting point is constructed ordinarily by the unit that is to occupy it.

In favorable terrain the interval between supporting points may be as great as 800 or 1,000 yards.

22–8. In considering the details of the organization of supporting points it is necessary to consider the work that can be carried out in the first three or four hours after the decision to intrench has been reached. Subsequent elaboration of the work depends upon developments in the tactical situation.

The necessary construction work involved will include the following:

1. Fire trenches.
2. Trenches in rear for the supports.
3. Communicating trenches between the support and fire trenches and between adjacent fire trenches.
4. Work on the foreground and clearing the field of fire.

All of this work should go on simultaneously. If this is not practicable, the work should be completed as indicated below.

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[1] For detailed discussion of trench fighting and bombing, which are beyond the scope of this work, see standard works on those subjects.

1. Clearing foreground to improve the field of fire and construction of fire trench.
2. Head or overhead cover; concealment.
3. Placing obstacles and recording ranges.
4. Cover trenches for supports and local reserves.
5. Communicating trenches.
6. Widening and deepening of trenches; interior conveniences.

Construction of Field Works

22–9. Infantry must be capable of organizing its own positions and of executing the field works necessary for their defense. The elementary requirements demand proficiency in respect to the following:

(*a*) Proper siting of intrenchments (**tracing of works**).

(*b*) Construction of fire trenches and communicating trenches (**standard profiles**).

(*c*) Employment of troops in the **execution of field works.**

(*d*) Construction of **trench accessories.**

(*e*) Rapid construction of **wire entanglements.**

(*f*) **Camouflage.**

22–10. The location, extent, profile, garrison, etc., of field works are matters to be decided by infantry commanders. Officers must be able to choose ground and intrench it properly. Engineer troops may be assigned to advise and assist in laying out and preparing the position, but infantry commanders are not thereby relieved from responsibility for the action taken in the organization of the position.

Trace

22–11. The term trace usually designates the horizontal projection on the ground of the firing crest. The firing crest should be as nearly horizontal as practicable and should therefore generally follow the contour of the ground. Considerations of drainage will, however, require a slight departure from the contour (see par. 22–17).

The protection acquired by digging a trench should be increased by choosing a trace that will avoid enfilade fire and by means of traverses. Traverses serve as protection against enfilade fire and limit the radius of action of shells bursting in the trench. The extent to which traverses are required depends upon the character of the trace (figs. 235–238) and the extent to which the trench is subject to enfilade fire.

STANDARD TRACES

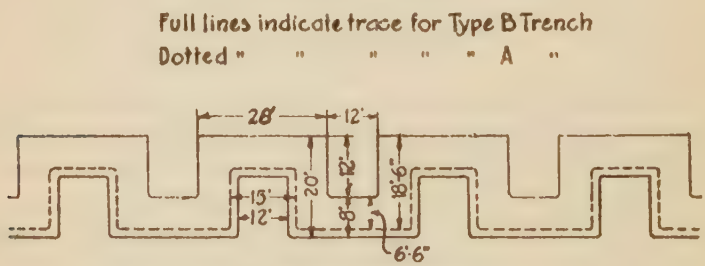


FIG. 235.—Traverse trace

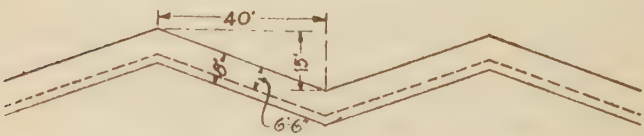


FIG. 236.—Zig-zig trace

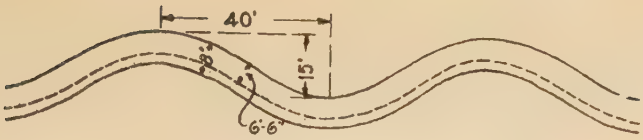


FIG. 237.—Wavy trace

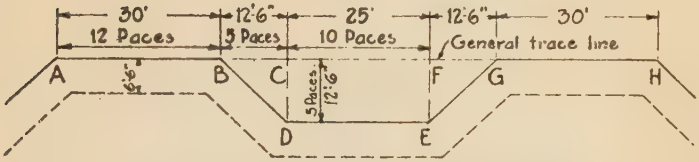


FIG. 238.—Octagonal trace. (Method of tracing indicated)

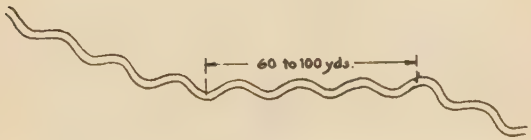


FIG. 239.—Wavy trace (right), with both local and general irregularities

FIG. 240.—Wavy trace (wrong); no general irregularities

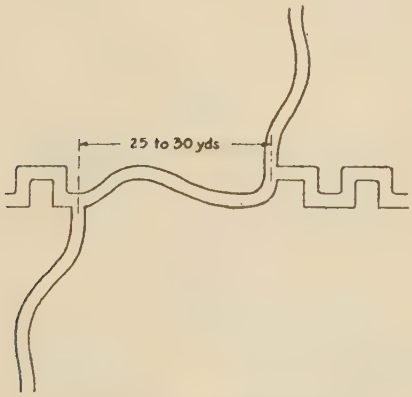


FIG. 241.—Approach crossing parallel

Profiles

22–12. The character of the profile of a trench depends to a great extent on the probable permanency of the projected work. Trenches which are to be utilized for a considerable period should have a profile corresponding as nearly as practicable to the natural slope of the ground in order to reduce the amount of revetment required and avoid the caving in of the sides of the trench. In the construction of hasty cover, on the other hand, the object should be to obtain

the most complete protection in the shortest possible time, and the slopes of the trench should be made as steep as the earth will stand and the width of the trench reduced to a minimum (fig. 243).

In permanent or semipermanent works, standard profiles are necessary in order to permit of the construction at the rear of standard revetting matériel (e. g., A frames, art. 22–32).

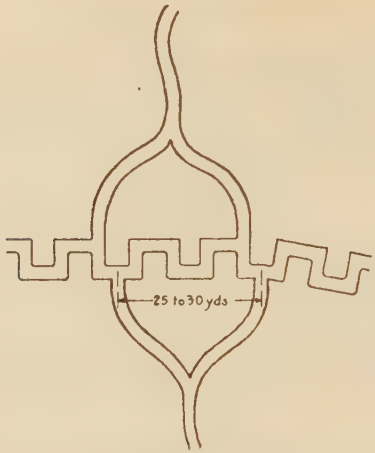


FIG. 242.—Alternative method

The development of hasty cover into a trench of standard profile is shown in Figure 246.

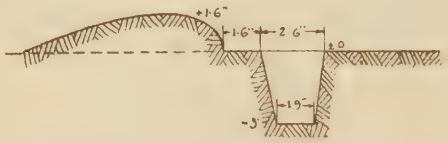


FIG. 243

22–13.—The standard profiles for fire and communicating trenches shown in Figures 244–250 are based upon the following principles:

(*a*) The elevation of 4 feet 6 inches between the interior crest and the banquette affords a good firing position for a man of average height.

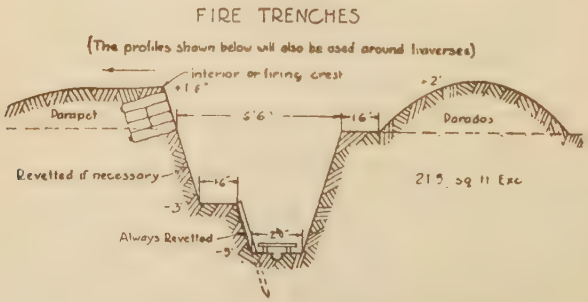


Fig. 244.—Type A. (For use without "A" frames)

(*b*) During its construction the trench may naturally be used to a greater or lesser extent, depending on the degree of completion. An excavation of 2 feet 6 inches, together with the parapet, gives a total cover of 3 feet, which is suitable for firing from a kneeling position. This, however, is only one phase of the construction; except during a momentary halt, the final aim is always to make the trench suitable for firing from a standing position.

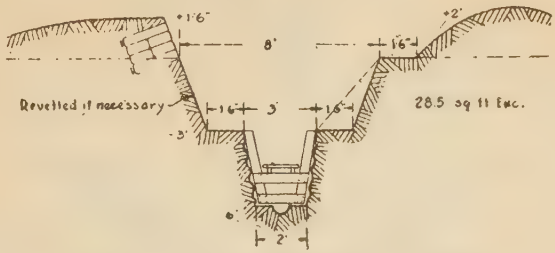


Fig. 245.—Type B. (For use with "A" frames)

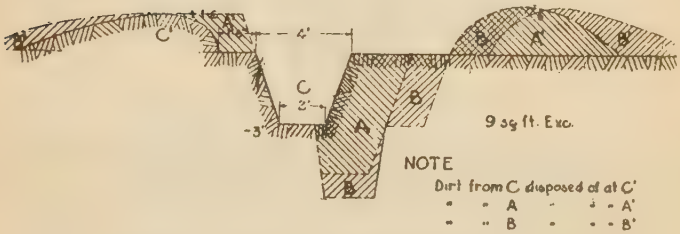


Fig. 246.—Simple standing trench. (Showing development into standard fire trench, Types A and B)

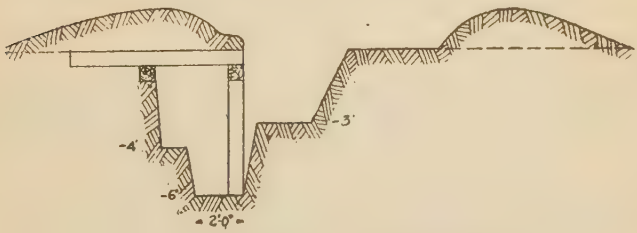


Fig. 247.—Standing trench with splinter-proof

COMMUNICATION TRENCHES

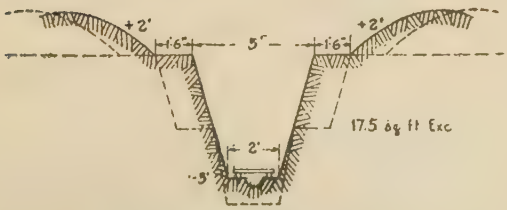


Fig. 248.—Type A. (For use without "A" frames.) (Also shows development to Type B)

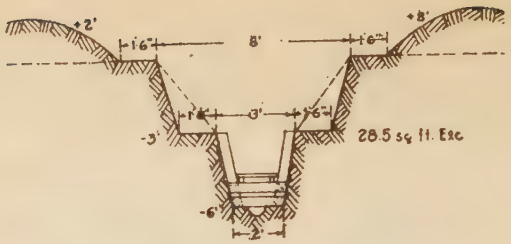


Fig. 249.—Type B. (For use with "A" frames)

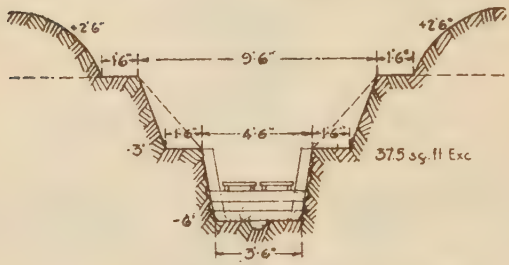


Fig. 250.—Type C. (Broad communication trench)

(*c*) The distance of 6 feet 6 inches between the interior crest and the bottom of the trench permits natural walking without being seen.

(*d*) The width of the trench at the bottom (2 feet) permits convenient circulation behind men on the banquette.

(*e*) The dimensions of the communication trench—7 feet of total cover—permit convenient circulation with good protection.

(*f*) Berms are indispensable for preventing the sides from caving in under the pressure of the excavated material; a width of 1 foot 6 inches is the minimum.

The standard profiles will often be modified, particularly with reference to the following:

Decreasing the width, thereby reducing the amount of excavation and increasing the protection for temporary or hastily constructed works;

Increasing the relief of the parapet so as to have a better view from the trench;

Decreasing the depth of the excavation (and consequently increasing the relief of the parapet) necessitated by the presence of water or rock near the surface;

Decreasing the width in very hard soil, which permits the trench to have steep sides;

Removing the excavated material from the edge of the excavation (trench without parapet, deep communication trench) or the use of an underground communication trench (Russian sap), where it is especially desirable to avoid being seen;

Need of protecting certain parts of the communications from hostile view and fire (covered communication trench);

Using natural cover (ditches, slopes, shell holes, etc.);

Increasing the width of the evacuating ("out") approaches and decreasing the width and depth of the secondary approaches.

Section II.—EXECUTION OF FIELD WORKS

22–14. The execution of a field work comprises:

(*a*) Reconnaissance of the position: (*b*) tracing on the ground of the lines which determine the horizontal limits of cutting and embankment, or establishment of trace by other method (e. g., stakes, compass bearings, Art. 22–25); (*c*) placing reliefs on the work; (*d*) actual construction of the trenches.

22–15. The construction of a field work should be preceded by a reconnaissance varying in extent with time available and the tactical situation. The objects of the reconnaissance are : (*a*) to determine the field of fire which must

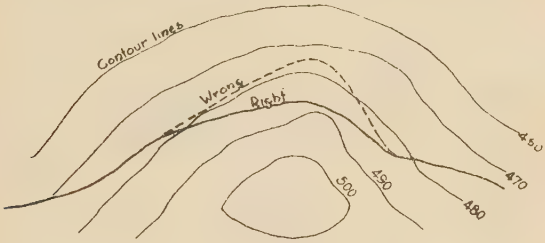
be covered and the flankings; (*b*) to determine the natural strong points of the position and the points of especial weakness; (*c*) to fix the general location of the lines with reference to the field of fire and the flankings and the requirments of drainage; (*d*) to compute the labor, tools, and material required for the construction of the position. When practicable, a sketch should be prepared on the ground showing the general location of the different lines, the observing stations and command posts, and other special works.

22–16. According to the situation, entrenchments are constructed either by working along the line or by working from the ends. The former method will generally be employed when not actually under fire. When exposed to hostile fire, the men dig in on the trace of the work so as to obtain cover in the most rapid manner possible and then work toward each other from the ends. Working from the ends is also resorted to in pushing out saps from an existing trench and in joining up sap heads so as to establish a new advanced parallel.

Working Along the Line

22–17. The trace is actually established with reference to the required field of fire by placing the eye at the level of the interior crest.

A tracing party for a field work to be held by a company should consist of an officer, a p. o., and three or four men, equipped if practicable with white tape, stakes, and mallets. The tape is used to locate on the ground the intersection of the cut and elbow rest. As a general rule, only the firing bays are staked out at the preliminary tracing, intervals for traverses being left between successive bays. In leaving space for traverses, a minimum thickness of 3 yards should be



Siting trenches to eliminate low spots

FIG. 251

allowed. Where tape is not available the trace may be marked with stones or stakes or by digging a small channel with a pick.

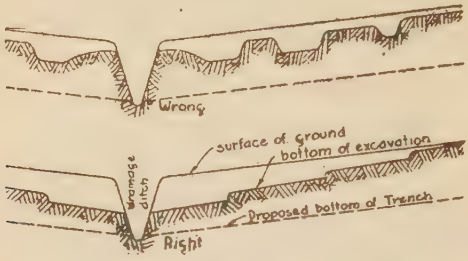
When practicable both cutting edges of the trench should be traced.

When practicable care should be taken to site trenches so that all parts can be easily drained toward natural points in the line, avoiding any unnecessary sag which will be difficult to drain later. Trenches should never run exactly along a contour line but should be given enough slope to carry the water in a prearranged direction. Trenches should not be located in marshy or boggy ground, unless it is absolutely unavoidable. Communication trenches should not be located in the bottom of valleys or gullies but should run along the side slope above the bottom. (Fig. 251.)

22–18. After the tracing has been completed the work is divided into tasks by means of marks made on the ground with a pick. The length of tasks depends upon the method of grouping the working details. In easy soil the proportion should be 1 pick to 2 shovels, and the working groups should be composed of three men each. In harder soil an equal proportion of picks and shovels should be allotted, and a working group will consist of two men. Working groups of three men should be allotted about 15 feet of front, groups of 2 men about 10 feet.

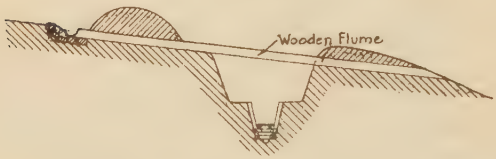
22–19. The unit assigned to the construction of the work should, as far as practicable, be divided into reliefs on the basis of tactical organization. A company should, for example, be divided into two reliefs of two platoons each, or three reliefs of one platoon each reinforced by units of the fourth platoon. The amount of work to be done by each relief should be plainly indicated; officers and p. o.'s are responsible that the men do the quantity of work assigned them. As soon as any unit (squad, platoon, company, etc.) has finished its task, it should be relieved.

22–20. Tasks should be allotted in terms of volume of excavation. In the allotment of tasks, the following data may be taken as an approximate basis: The capacity of the average man for continuous digging does not exceed 80 cubic feet for easy soil, 60 cubic feet for medium soil, 40 cubic feet for hard soil. He will do three-eighths of this the first hour, five-eighths in the first two hours, and the other three-eighths in another two hours. When contact with the enemy is probable, tasks should be assigned which can be reasonably expected to be completed in a period of two hours in order to conserve the fighting capacity of the troops. For the first relief, the soil is apt to be loose and the lift is less, so that a slightly greater task should be given to it than to succeeding reliefs. Assuming men at 5-foot intervals, the number of hours' work required to dig a



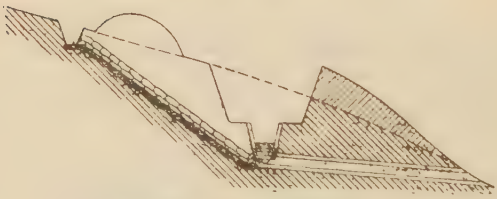
Longitudinal section of Trench under construction.
(Showing manner of excavating Trenches so as to insure proper drainage)

FIG. 252



Surface water carried over the Trench.

FIG. 253



Surface water carried under the Trench.

FIG. 254

trench is the section of the trench in square feet divided by 5 for easy, 4 for medium, and 2½ for hard soil.

22–21. In the construction of trenches, arrangements for drainage should, when practicable, be made from the beginning. A drainage ditch or sump should be started before the digging of the trench commences, and the progress of its excavation maintained in advance of the trenches draining into it. The excavation of the trenches should be directed upgrade, when practicable, so as to avoid the formation of undrained pockets in the bottom of a partially completed trench. Gutters for intercepting surface water and conducting it to the natural watercourses should be provided on the uphill side of the trenches. (Figs. 252–254.)

22–22. To place a relief on the work, the units constituting the relief approach the tools in column of files, rifles slung, and pass between the pile of tools, shovels on the right, picks on the left. Each man receives a tool as he passes.

The column proceeds to a flank of the trace of the work and forms line parallel to and about three paces in rear of the rear cutting line, men at about 5 feet interval. This interval is most conveniently established by having men extend arms horizontally and touch hands. Each platoon is assigned a particular part of the line and goes to it and deploys independently. If the line is long, guides should be furnished to direct the head of each column to the point where its deployment is to begin. At night, guides must always be furnished.

22–23. As soon as the men are posted, the pick men start tracing the limits of their tasks (unless already marked), digging a small furrow along the white tape and then marking the lateral and rear limits. The men then strip the sod or spade off a slight thickness of earth from the width of the excavation. The sod may be used to form a mask or small parapet or laid aside for subsequent use in revetment or for sodding the parapet when completed. If it is necessary to provide cover rapidly, the men at once dig in depth so as to get some cover as quickly as possible. As a general rule, the excavation should be begun with a width slightly less than that desired. When completed, the walls are dressed up to the desired width.

When work is done at night in the presence of the enemy, men must keep absolute silence, lie down immediately on the ground when a rocket goes up, and resume their work when the light has disappeared.

Separate working groups should be assigned to the construction of the trenches around traverses. Unless labor is abundant, their construction should generally be deferred until the fire bays are completed.

Working from the Ends

22–24. Working from the ends is a slow operation, but it permits working at points and at times when working along the line is impossible. The construction may be accelerated by (*a*) doubling the working parties (shifts working at high pressure and relieving each other at frequent intervals, e. g., every yard of trench); (*b*) by working in two stages (i. e., one group digging to a certain depth, followed by a second group excavating to full depth).

In zones swept by hostile fire, working along the line and working from the ends are employed alternately. The following examples illustrate the application of this method of work:

(*a*) We hold the front *A–B* and wish to establish oursleves at *C–D* (Fig. 255). It is assumed in this case that working along the line is impossible during the day

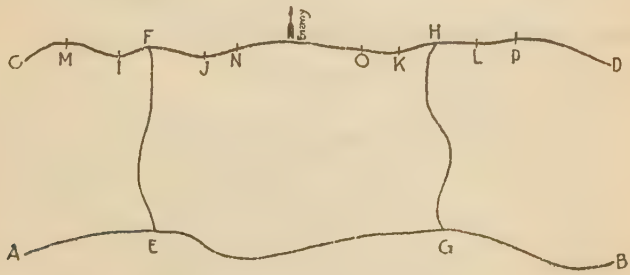


FIG. 255

but may be carried out at night, and that working from the ends is possible during the day.

The work may be executed as follows:

First night. Constructing, by working along the line, the approach trenches *E–F* and *G–H*, and the elements *I–J* and *K–L* of the parallel.

First day. Continuing the work of the first night by constructing the elements *M–I*, *J–N*, *O–K*, *L–P* (working from the ends, 4 shifts).

Second night. Constructing the element *N–O* (working along the line).

Second day. Continuing the work of the second night.

(*b*) As another example, we desire to construct an element of a parallel or of an approach trench *A–B* (fig. 256) on ground where working along the line is too dangerous, even at night.

The procedure is then as follows: Instead of beginning work on the entire length *A–B* at the same time, we begin with small groups, such as squads,

separated and working at 1, 2, 3, and 4. These groups dig themselves in as rapidly as possible by working along the line. Once they have a sufficient cover, each group separates into two parts which work at both ends of the excavation (working from the ends) under the cover already dug.

22–25. When working from the ends in one stage, the method of work is, in general, as follows:

Each working party consists of one p. o. leader of the party, and 4 workmen grouped into two shifts which relieve each other every yard. For continuous work, night and day, the working party should comprise one 1st p. o., 1 subordinate leader, and 12 men, thus providing three reliefs of 8 hours each.

In each shift, No. 1 is the digger and No. 2 the shoveler; at each shift they change their posts, No. 2 becoming No. 1, and vice versa. No. 1 is supplied with a short-handled pick mattock, a short-handled shovel, and measuring

FIG. 256

sticks for testing work. No. 2 is supplied with an ordinary shovel. The working party is, in addition, provided with 1 extra pick, 1 extra shovel, and 5 stakes.

The p. o. in charge of the party sees to it that the trace is followed and that the dimensions are correct.

When beginning work, each shift marks with a stake the spot at which it is to begin.

If the excavation has not been marked out beforehand, the 1st p. o. marks out the center line of the element to be constructed by means of stakes set at the bottom of the trench (fig. 257).

No. 1 (digger) works at the head of the excavation. He digs it to the final width and depth. First, from a squatting or kneeling position, he digs two grooves to the depth of the pick blade half-way up the excavation, keeping in line with the two walls and preserving the banquette, if it is to be a fire trench;

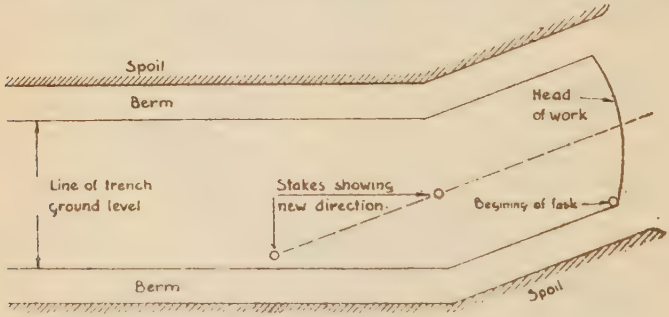


FIG. 257

he then digs away the earth between the two grooves with the pick; he passes the earth between his legs by means of the short-handled shovel and scrapes the bottom so as to keep the trench at the correct depth. He then digs the upper part of the trench by marking two grooves, right and left, up to the surface of the ground, digs away the earth thus undermined with his pick and passes it to the rear as described above.

He thus advances by elements of 1 to 1½ feet, and at intervals, verifies the dimensions by means of the notched stick.

No. 2 (shoveler) throws the earth on both sides and is careful to leave the berms.

Nos. 1 and 2 may exchange posts at the middle of the task.

When in danger of enfilade fire, it is necessary to protect the head of the work by a head parapet of sandbags, gabions, or metal shields. These are placed

about 1½ feet in front of the head of the work by Nos. 1 and 2 and are pushed forward by hand or with the tools as the work progresses.

As soon as one shift has finished its task of 1 yard, the p. o. in charge of the work orders, "**Change,**" and the shift lays down its tools and is replaced by the second shift.

Working from the ends in two stages is executed in accordance with the following method (fig. 258).

Each party consists of a petty officer in charge of the work and 8 men, divided into two shifts which relieve each other every yard. When the work is to be continued day and night, the working party should comprise one 1st p. o., one additional leader, and 24 men, thus providing three reliefs of 8 hours each.

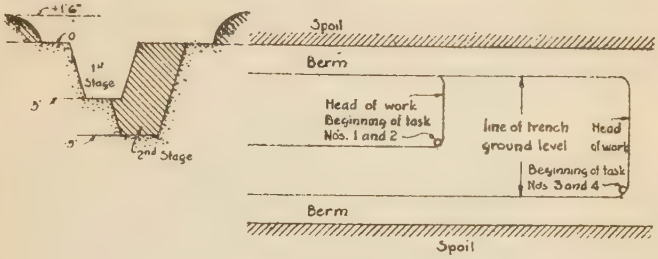


FIG. 258

In each shift, the men are numbered from 1 to 4; Nos. 1 and 3 are diggers, and Nos. 2 and 4 shovelers; at each shift, Nos. 1 and 2 change posts with Nos. 3 and 4.

Nos. 1 and 2 work at the head; they dig the first stage 3 feet deep. They have the same tools as Nos. 1 and 2 in the case of working in one stage. No. 1 is, in addition, supplied with a meauring stick.

Nos. 3 and 4 work 3 yards behind the head of the work; they deepen the first stage to the correct depth and widen it. They distribute the excavated material on both sides, being careful to leave berms of the correct width (1 foot 6 inches). No. 3 is equipped with a pick mattock and a measuring stick; No. 4 with a shovel. Each working party is, in addition, supplied with 1 extra pick mattock, 1 extra shovel, and 5 stakes.

Section III.—ACCESSORIES OF TRENCHES

Revetment

22–26. Revetment comprises any artificial means provided to cause earth to stand at a slope steeper than it would naturally assume.

It is used in the construction of parapets, trenches, and other field works. Its too extensive application is objectionable on account of the great amount of time, labor, and material required, and can often be avoided by widening and sloping to a safe angle the sides of existing trenches as well as by the provision of berms or shelves at various levels (see figs. 244–250 for trench profiles requiring little revetting).

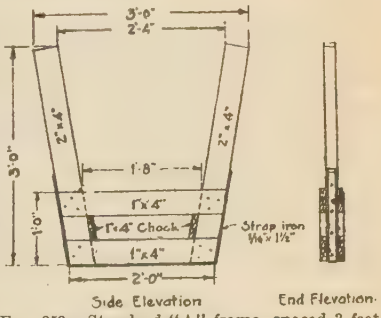


FIG. 259.—Standard "A" frame, spaced 3 feet center to center

22–27. The main principle in revetting trenches is to revet only the lower 2 or 3 feet. This portion of trench is seldom injured by the enemy's fire, while higher revetting requires more time, labor, and material, and will almost certainly block the trench if damaged by shell fire. High revetment should be limited to the repair of damage to the trench.

22–28. The best method of revetting trenches is:

(*a*) Use standard *A* frames, spaced 3 feet center to center and supporting sheets of corrugated iron, expanded metal, planks, or brushwood (fig. 259).

(*b*) If *A* frames are not available and the soil permits, the revetment may be supported by means of pickets driven into the bottom of the trench and braced as shown in Figure 264.

(*c*) The sides of the trench above the revetment should be cut to a slope of about 3/1, leaving a berm of 18 inches on each side at the foot of the unrevetted slopes.

The order in which the revetment of trenches should be undertaken is as follows (figs. 244, 245, 249):

(*a*) Revet the **fire step** and the interior slope of the **parapet** in fire trenches.

(*b*) Revet the lower 2 or 3 feet in communication trenches.

(*c*) Revet the lower 2 or 3 feet of fire trenches above the fire step, if necessary.

There are two general types of revetments:

(*a*) The **retaining wall** type which is self-supporting and is best suited to **fills.**

(*b*) The **superficial** type, which must have independent supports and is best suited to **cuts.**

RETAINING-WALL TYPE

22–29. As revetments of this type must be self-supporting, they should always take the form of a properly built retaining wall, i. e., the thickness at any level should be at least one-half the remaining height and the average thickness not less than one-third of the total height.

22–30. Sandbag revetment is easily and quickly constructed, gives no splinters from shelling, and is especially useful for emergency work, for repairs, and for crowning. In laying sandbags attention should be paid to the following points, some of which are illustrated in Figures 260 and 261.

(*a*) Tuck in bottom corners of bags before filling.

(*b*) Fill bags uniformly about three-quarters full.

(*c*) Build revetment at slope 41.

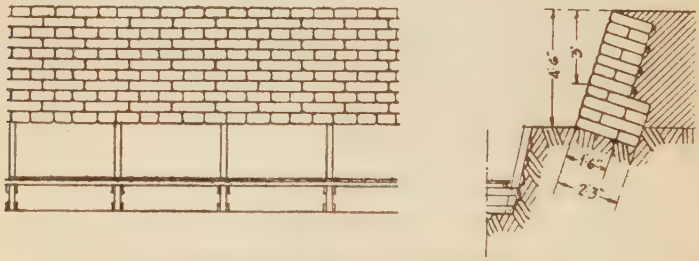


FIG. 260.—Sandbag revetment. Correct method

(*d*) Lay bags with beds perpendicular to slope.

(*e*) Lay bottom row as headers on prepared bed, intermediate rows alternating headers and stretchers, top row headers.

(*f*) Lay bags with seams and choked ends inward.

(*g*) Break joints and beat bags into a rectangular shape.

(*h*) A sandbag revetment will last much longer if netting, preferably doubled is placed over the face, as shown in Figure 262.

22–31. Sod revetment is more durable than sandbag revetment, and where sod can be obtained in sufficient quantity its use is recommended. Sods are cut 18 inches by 9 inches by 4½ inches, laid grass down, except the top layer, and pinned together with wooden pegs. The principles *c*, *d*, *e*, and *g* of article 22–31, for sandbag revetment, apply equally to sod revetment.

SUPERFICIAL TYPE

22–32. This form of revetment consists of two parts: The **revetting material,** which retains the earth, and the **supports,** which hold the revetting material in place. It is most useful in retaining the slopes of trenches, since practically no additional excavation is needed to afford space for the revetment itself.

The **revetting material** may consist of corrugated iron, planks, expanded metal, brushwood, wire netting, poles, or other available material.

The **supports** may be:

(*a*) **Standard A frames**, for use in the bottom third of the trench as described in article 22–28. Methods of placing these frames around corners in traversed trenches are shown in Figure 263.

(*b*) **Anchored revetting pickets**, for use in revetting front slopes of fire trenches or in other special cases where high revetment is required.

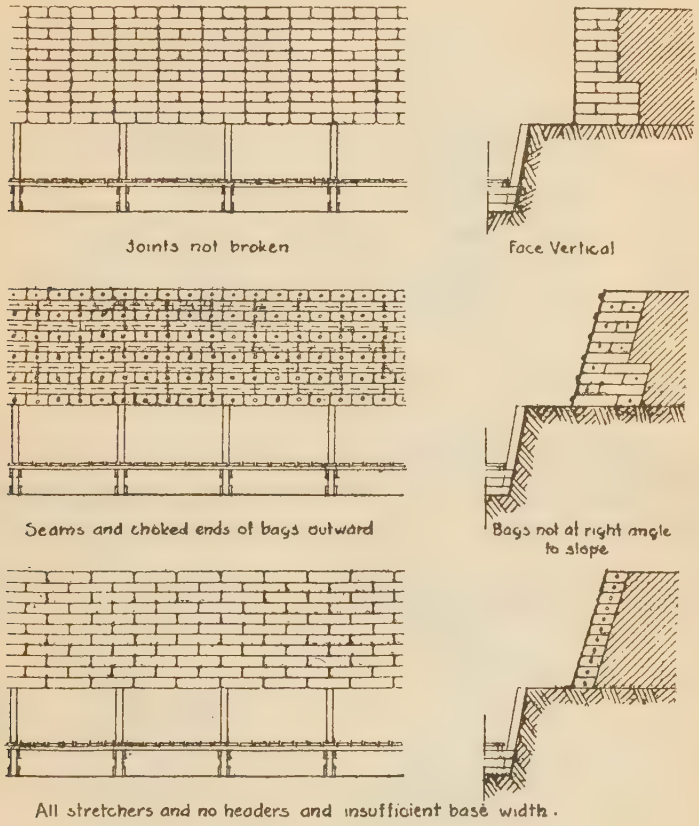


FIG. 261.—**Sandbag revetment.** Incorrect method

FIG. 262.—Sandbag revetment. Reinforced

Revetting pickets should be from 3 inches to 3½ inches in diameter, straight pointed at the small end, and driven into the ground from 1 to 1½ feet.

Anchor stakes should be driven firmly into solid ground 8 to 10 feet from the edge of the trench, staggered so as to avoid a plane of weakness parallel to the trench, and inclined so as to be perpendicular to the direction of pull on the anchorage wire.

Anchorage wires should pass at least four or five times between picket and stake. Each time take a round turn around the top of picket or stake and then tighten with a rack stick or windlass.

(*c*) **Unanchored revetting pickets** for use only with low revetments such as fire steps. They are supported by being driven from 2 to 2½ feet into the ground and must always be braced at the ground level, as shown in figure 264.

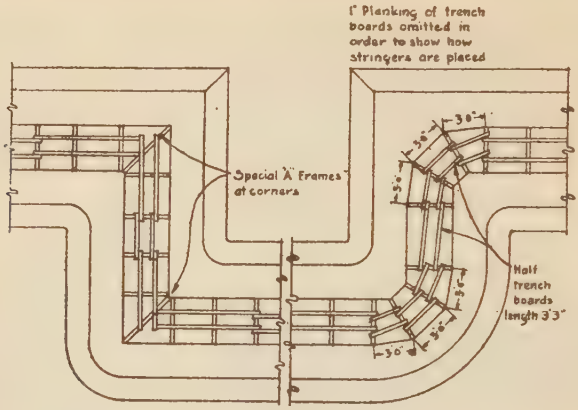


FIG. 263

(*d*) **Struts** resting against opposite walls of the trench for use only in narrow deep trenches, such as shell slits (fig. 265).

22–33. In placing wire-netting revetment, the following procedure should be observed:

(*a*) Cut vertical grooves in the slope at about 3-foot intervals to hold revetting pickets.

(*b*) Drive the two end pickets of each bay first and anchor them back loosely.

(*c*) Stretch a double thickness of wire netting taut between the two end pickets.

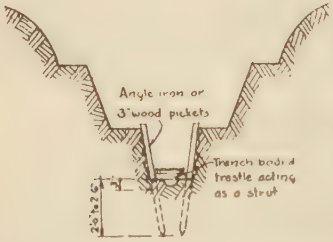


FIG. 264.—Braced revetting pickets

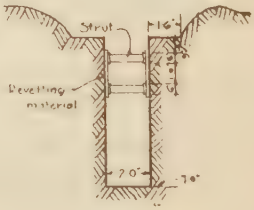


FIG. 265.—Shell slit

(*d*) Tighten anchor wires so that the end pickets set back into their grooves.

(*e*) Drive the remaining pickets and anchor them back so that they set into the grooves, thus drawing the wire netting tight against the surface to be revetted.

22–34. In placing **brush revetment,** the following rules should be observed:

(*a*) Brush should be clear of leaves and is best about ¾ inch in diameter.

(*b*) Pickets should be driven in at about 3-foot intervals, leaving from 4 to 6 inches behind them for the brush.

(*c*) When brush has been built up to the top, pickets should be firmly anchored back, drawing the brush close against the slope to be revetted.

Lookout Posts

22–35. When located in a trench, **lookout posts** usually consist of niches dug in the interior slope of the trench and covered from the rear by a sandbag wall and on top by a splinter-proof layer (boards or logs with a top layer of sandbags).

22–36. The loopholes are reserved for the lookouts for watching the enemy and for harassing fire; during combat the men fire over the parapet. Loopholes are made of wood, sandbags, metal shields, etc. (Figs. 266–269.)

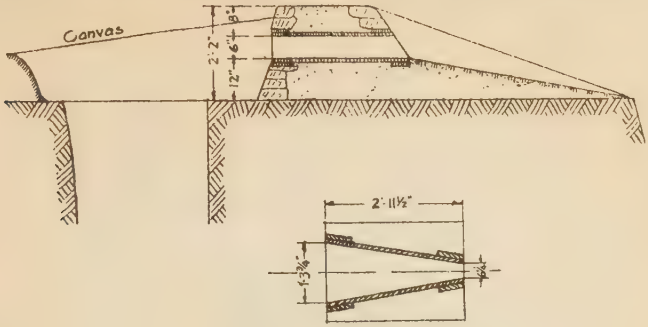


FIG. 266.—Loophole of wood

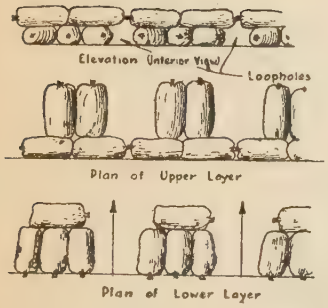


FIG. 267.—Loopholes of sandbags

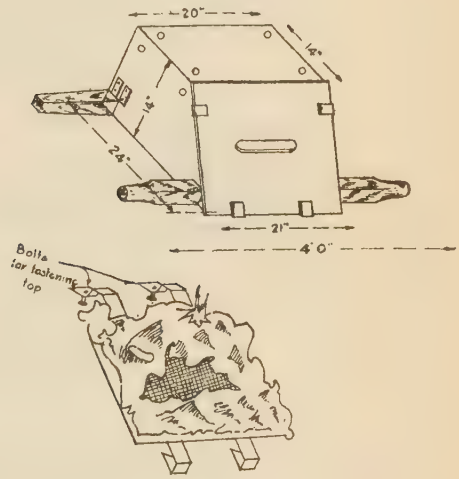


FIG. 268.—Portable armored observation post

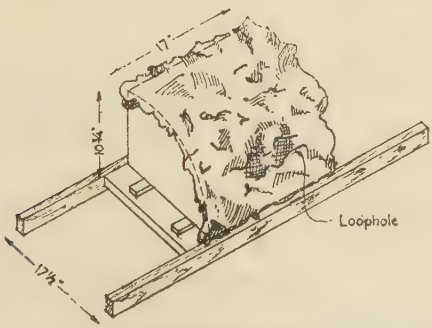


FIG. 269.—Roll-top steel observation post

The exterior opening should be concealed by a cord trelliswork or other means that will allow the barrel of the rifle to protrude

It is essential that the enemy should not be able to distinguish whether the loophole is manned or not. The loophole must not therefore have as a back-

ground the sky, or a wall, or other object whose color contrasts with that of the trench. A cloth may be hung behind the head of the lookout to furnish the background.

Whenever possible, the loophole should be oblique with respect to the enemy's trench; the lookout is better protected and the loophole is less visible (see fig. 270).

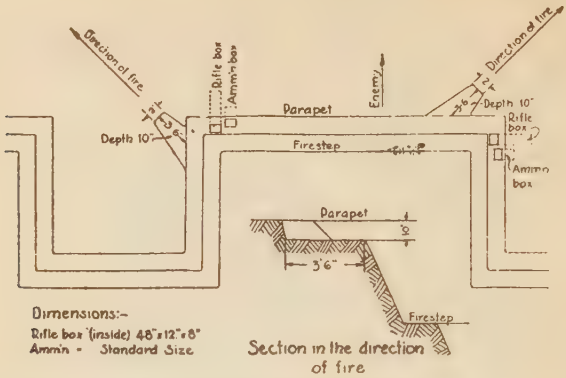


FIG. 270.—Automatic rifle positions

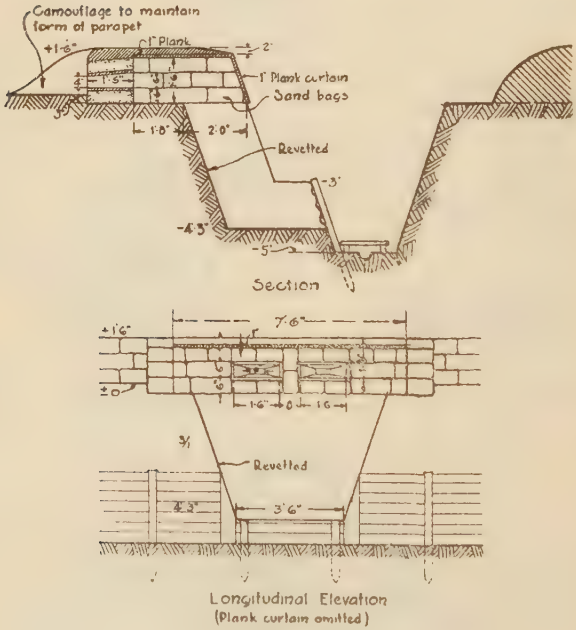


FIG. 271.—Snipers' post

Miscellaneous

Plans for automatic-rifle positions, snipers' posts, ammunition recess, and latrines are shown in Figures 270–274. Latrines should be dug as deep as possible under existing conditions and should have covers to keep out flies. They should be disinfected frequently. Men should cover their excreta with earth. They should be dug in as lateral trenches from communication trenches and parallel to the main trenches.

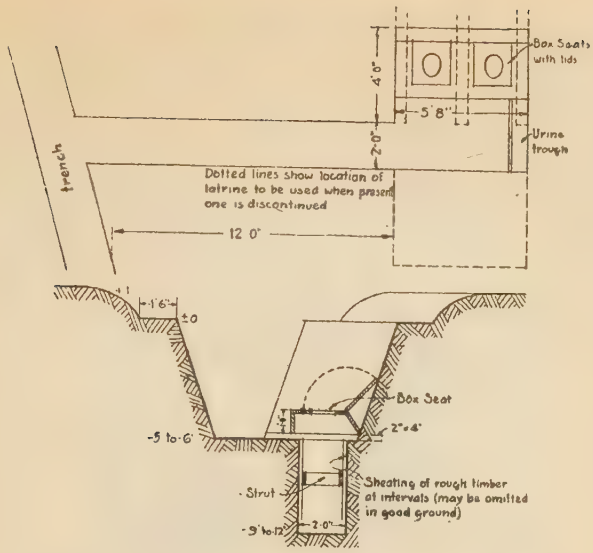


FIG. 272.—Deep latrine, box-seat type. (See figs. 297 and 297a)

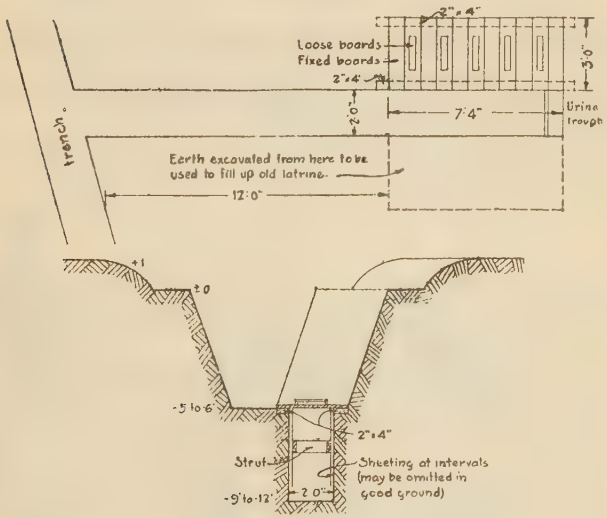


FIG. 273.—Deep latrine, straddle type

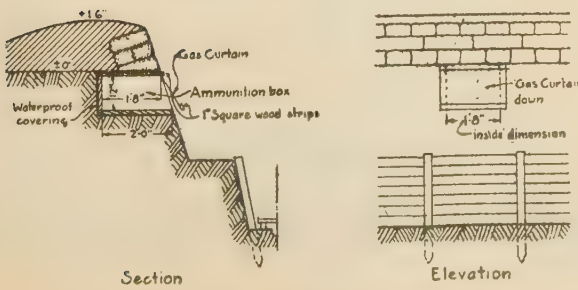


FIG. 274.—Standard ammunition or grenade box

Machine and Field Gun Emplacements

22–37. Machine guns are employed in the fire trenches or in specially prepared emplacements in the intervals.

Artillery is usually placed behind the line of infantry defense, natural cover being utilized as far as possible.

When an artillery position is in flat terrain which is visible to the enemy, gun pits may become desirable to increase the concealment. The diagrams, Figures 275 and 276, show types of hasty and deliberate intrenchments. These afford no cover from overhead fire or from observation by aircraft.

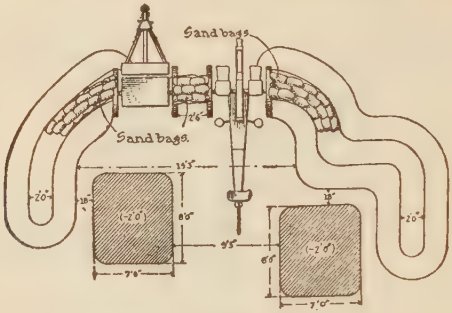


FIG. 275

Section IV.—HASTY INTRENCHMENT UNDER FIRE

22–38. The work must be done by the men lying prone on the left side.

Men first shift their positions as necessary to obtain a clear field of fire to the front. The work is then executed as follows:

Lie back about 2 feet from the selected position and to the left of it, head at the point *X*, Figure 277. Tear up any vegetation available, and heap it up loosely as a screen at full arm's length to the front.

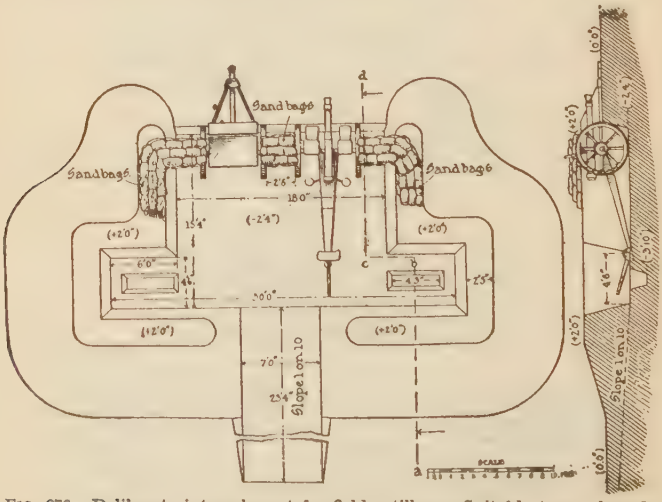


FIG. 276.—Deliberate intrenchment for field artillery. Suitable type when depression is necessary for concealment

Lying on the left side and using the intrenching tool, hack the earth loose into a furrow about 1½ feet to the right of the body and extend it as far to the front and rear as possible. Scoop out the earth and heap it close in front of the left eye and shoulder.

Dig toward the body from the original furrow so that the blade of the intrenching tool is worked under the hard surface crust. Continue to scrape the earth toward the parapet and to widen the trench until it is about 1½ feet wide. Any lumps available should be used to build up the near edge of the parapet as steeply as possible. The earth should be so disposed as to thicken the parapet in a line between the head and the point from which the most accurate fire appears to come, or, if necessary, extend the parapet in the shape of a horseshoe around the front of the trench.

When the depth of the trench reaches about 6 inches in front and 12 inches in rear, and the parapet is 6 inches high and bullet-proof (a thickness equal to the length of the rifle is sufficient), some vegetation, if any is available, should be scattered over the parapet to conceal the fresh earth.

Each man must be ready to lay down his intrenching tool and to resume firing with his rifle at any stage of the work.

22–39. Adequate cover at close range can not be obtained in less than 35 minutes. This form of trench is ineffective against shrapnel fire. A rifle pit

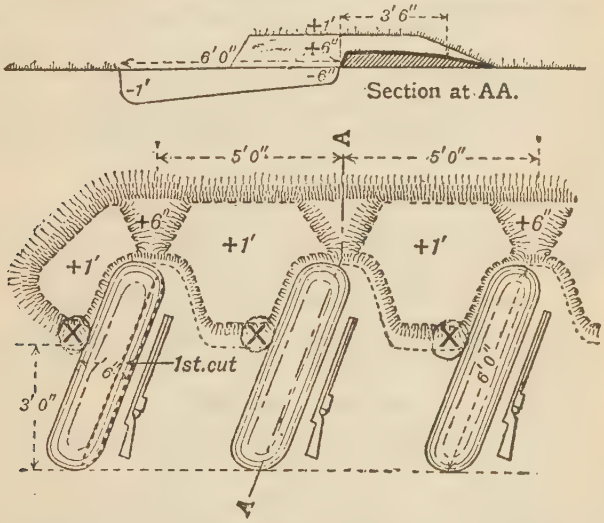


FIG. 277.—Early stages of intrenchment by riflemen lying prone in the open, using intrenching tool under fire. If under shrapnel fire all efforts should be directed toward making a deep hole and not a shallow trench

from 1½ to 2 feet deep and as narrow as practicable, with a parapet about 1 foot high, is the best hasty shelter against artillery fire.

To construct such cover from the skirmisher's trench, excavate the pit at the point occupied by the elbows, until sufficient cover has been obtained.

Section V.—OBSTACLES

22–40. In field warfare, the amount of artificial obstacles which can be prepared will be extremely limited, unless materials, time, and labor are abundant, and great discrimination is necessary in order to make the most of available resources.

There are three objects to be kept in mind in arranging a system of obstacles, viz:

1. Obstacles should break up the unity of action and cohesion of the attacking troops.
2. They should tend to deflect the parties thus isolated into the best swept fields of fire.
3. They should finally arrest the attacks under the close fire of the defenders.

22–41. Obstacles naturally divide into **deflecting obstacles** and **barrier obstacles.** Deflecting obstacles may be placed at any distance from the firing points, but should be under effective fire. Natural obstacles on the ground, such as hedges, fences, ditches, walls, etc., are modified to act as isolating and deflecting obstacles.

22–42. Barrier obstacles should be under fire throughout every yard of their length and within close range of the defenders. No part of the obstacle should be farther than 100 yards away; in the World War it was customary to place them much closer. The following requirements should also be considered in the construction of barrier obstacles:

1. They should be as wide as time and material will allow.
2. They should afford no cover to the enemy.
3. They should, if possible, be sheltered from artillery fire.
4. They should be strongest at those points which are under the least effective fire.
5. They should be difficult to remove or destroy, to cut through, or to crawl under, or climb over.
6. They must not betray the firing points and must be concealed.
7. They should be constructed with passageways, well covered by fire, to permit the ready advance of the defenders.

22–43. The most usual obstacles are the following:

1. **Heavy abattis.**—Large trees felled side by side, branches toward the enemy, and interlaced with support wires (usually barbed wire), closely interlaced.
2. **Light abattis.**—Branches cut off trees, crowded together, securely anchored down to the ground, and interlaced with wire as above.
3. **Tree entanglements.**—Medium-size trees cut nearly through, 3 or 4 feet above the ground; branches forced down to the ground and securely pegged down and the stumps used as posts for a strong wire fence; the branches are interlaced with wire.
4. **Wire entanglements.**—Fully treated below.
5. **Inundations.**—The flooding of areas is most effective, but ordinarily expeditionary forces will not require such an expedient in their prosecution of military operations.

Section VI.—WIRE ENTANGLEMENTS

22–44. Infantry will be trained in the construction of low wire entanglements, the double-apron fence, and portable wire obstacles. (Arts. 22–51, 22–52, 22–53.)

General Principles

22–45. Barbed-wire entanglements should be located in accordance with the following principles:

(*a*) They must be covered at every point by our own rifle or machine-gun fire, either frontal or enfilade. Special emphasis must be laid on the principle that the entanglement and machine-gun positions should be so sited with reference to each other that the front of the entanglement is swept by the fire of machine guns. This is the most important consideration in siting barbed-wire entangle-

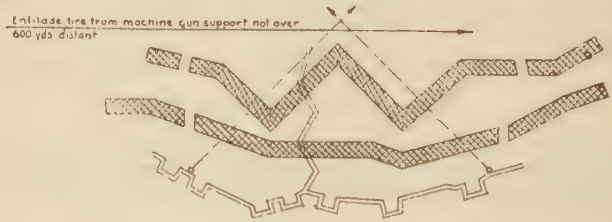


FIG. 278.—Enfilade of entanglement

ments (see fig. 278). Obstacles have no inherent value of their own; they serve only as an auxiliary to the fire power of the troops. If the attack succeeds in neutralizing the troops behind the wire, the entanglement is valueless.

(*b*) They must not be so far from the trench that they can not be kept under observation and control at all times, especially at night.

(*c*) They must not be so close to our own trench as to permit the enemy to approach to bombing range of the position without being discovered. A distance varying from 30 to 60 yards will generally be most suitable.

(*d*) They must be concealed as much as possible from the enemy's observation, both terrestrial and aerial, especially from his ground artillery observation

stations. Full advantage should be taken of depressions in the ground, tall grass, woods, and reverse slopes.

(*e*) The belt of wire should, as far as possible, avoid paralleling the fire trench; and in addition it should be irregular in width and height. The first consideration will prevent the enemy artillery from ranging on the trenches to destroy the entanglement; the second, from knowing definitely when the wire has been destroyed.

Special precaution must be taken in locating the entanglement to avoid indicating the manner in which the ground is occupied.

Design

22–46. The following principles govern the design of the entanglements:

(*a*) Within limits, a broad, thin entanglement is better than a narrow, thick one; the former, while equally effective, is less liable to destruction by artillery fire, as well as less visible.

(*b*) Two belts of entanglements, separated by a space of from 10 to 50 yards, are better than the same amount of entanglement in one belt.

(*c*) The entanglement must be well supported and anchored to the ground by means of pickets and posts, so as to be difficult to flatten out or drag aside.

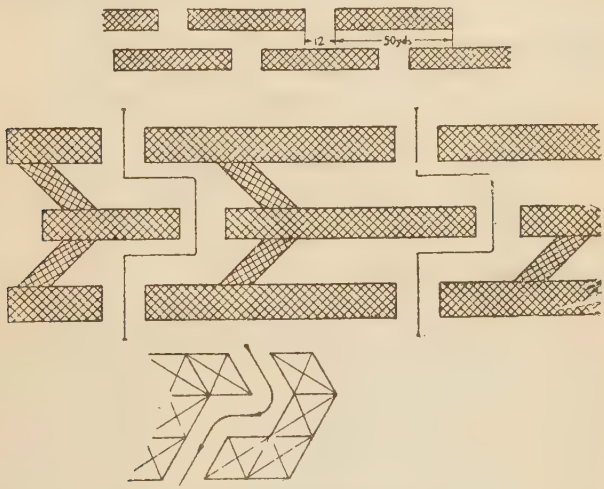


FIG. 279.—Gaps in belt of wire

(*d*) Sufficient barbed wire must be used to prevent easy penetration. Some loose tangled wire in the entanglement is difficult to clear aside after the wire is cut.

(*e*) The entanglement should be provided with blinded gaps for the passage of our men. A gap of about 12 feet in every 50 yards is usually left. Means to block the gaps must be at hand (figs. 279 and 284).

(*f*) The entanglement should present in its first stages an obstacle behind which the wiring party can work under protection and which can be subsequently added to and improved as desired.

Matériel

22–47. The following data are descriptive of the matériel employed in the construction of entanglements:

(1) Barbed wire:

(*a*) *Length.*—The length of wire on a reel varies from 50 yards to 100 yards. Reels will, if possible, be issued in standard 50-yard lengths.

(*b*) *Weight.*—The weight, including drum, is about 28 pounds for the 100-yard reel and 15 pounds for the 50-yard reel.

(*c*) *Marking end of wire.*—The plain wire securing a reel of barbed wire must be cut, and a piece of sandbag or white cloth tied to the running end, in order

that there will be no difficulty in finding it at night; the pieces of tin on the wooden drums must be broken off to prevent noise. These preparations must be made before the matériel is taken out for work.

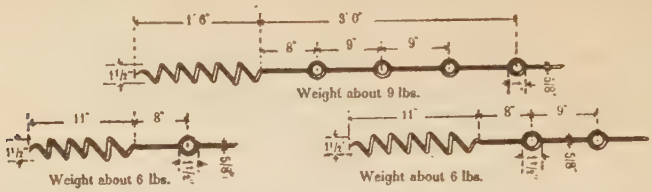


FIG. 280

(2) **Pickets:**

(*a*) *Wooden*—

	Long	Short
Length	5 feet	2½ feet.
Diameter	3 to 3½ inches	2½ to 3 inches.

(*b*) *Screw* (see fig. 280)—

	Long	Medium	Short	Anchorage
Length	5 feet	3½ feet	1½ feet	
Diameter	⅝ inch	⅝ inch	⅝ inch	
Weight	9 pounds		6 pounds	3 pounds.

(*c*) *Angle iron*—

Length, 5 feet 10½ inches and 3 feet 6 inches.
Weight, 10 pounds and 6 pounds.

(*d*) All bundles of screw and iron pickets should be prepared for carrying by being wrapped with a sandbag and secured in at least two places by a turn of plain wire with the ends twisted together. Enough wire must always be left at the ends so that it can be untwisted by hand without pliers.

(*e*) Bundles of long wooden pickets should be tied together in at least two places with plain wire. Short wooden pickets are best carried in sandbags, eight in each bag; two bags are tied together and slung over the shoulder.

(3) **Wire cutters:**

It very seldom occurs that there are enough wire cutters to give a pair to every man in a wiring party which consists of not more than 25 men. If stores have been properly prepared beforehand, there is no necessity for more than two pairs to each party, which should be carried for use in emergency.

FIG. 281.—Coiled rope on maul

(4) **Mauls:**

Coiled rope should be fastened on end to deaden sound (fig. 281). Where rope is not available, sandbags should be carried for use as mufflers on heads of pickets.

22–48. The task of throwing loose wire into an entanglement is a long and tedious one. It is made very much easier and quicker if the wire is coiled in a spiral beforehand. Spirals are prepared in accordance with the following methods:

Drive two 3-foot stakes, 3 feet apart, and two more at right angles to the first two, 1.5 feet apart (fig. 282). Then wind 75 yards of barbed wire around the

diamond-shaped framework thus formed, gradually working it up the stakes in a spiral. Finally, take the spiral off the stakes and tie it together in four places with plain wire.

A man can easily carry a spiral thus made on his shoulder in a trench.

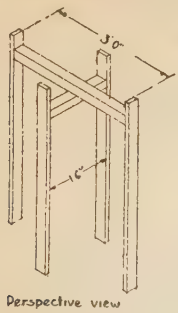


FIG. 282.—Framework for making spirals

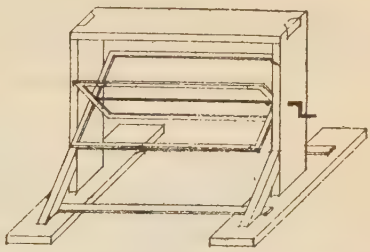


FIG. 283.—Winch for making spirals

22–49. The following are convenient approximations of man loads:

	Number	Average total weight
Wooden pickets:		*Pounds*
Long	4	
Short	16	
Screw pickets:		
Long	4	36
Medium	6	36
Angle-iron pickets:		
Long	4	45
Short	6	27
Barbed wire:		
100-yard reel	1	28
50-yard reel	2	30
Loose wire—spirals	1	20
Anchorage pickets	8	26

Time and Men Required

22–50. The following table, showing time and men required to construct the different standard entanglements, is based on the assumption that work is carried out under the following conditions, with good average parties, not picked men:

(*a*) Stores are taken up by a separate carrying party as far as the fire trench only.

(*b*) The entanglement is erected 40 to 50 yards from the fire trench; stores have, therefore, to be carried out that distance by the wiring party.

(*c*) Men work equipped to meet attacks.

Pattern and length	Wiring party		Carrying party		Average time by daylight	Average time by night
	P. O.	Men	P. O.	Men		
					Minutes	*Hours*
50 yards low or knee-high wire	1	7	1	17	30	1–1¼
50 yards double-apron fence	1	9	1	15	30	¾–1

The size of the carrying parties should be so regulated as to avoid delaying the wiring party on account of lack of material. The carrying parties defined in above tables can carry *at one trip* sufficient stores for 50 yards of entanglement. If more than 50 yards are to be constructed and all the material is to be carried in one trip before the wiring party commences work, the carrying parties must be proportionately increased. If, for example, 200 yards of entanglement are to be constructed, a carrying party of four times the strength of that given

will be necessary. If, on the other hand, the wiring party is to be supplied by *repeated trips* of the carrying party, the amount of wire carried at each trip must be sufficient to supply the wiring party until the next return of the carrying party, and the time required for the round trip to the matériel depot must therefore be considered. If, for example, the round trip to the matériel depot required 1 hour and the length of the entanglement is 200 yards or more, the strength of the carrying party required will be twice that given in the table.

For long lengths of entanglement (over 100 yards) a small additional carrying party of three or four men is formed to supply the wiring party with material for the fire trench and to serve as replacements for casualties.

Description of the Standard Obstacles

LOW (OR KNEE-HIGH) ENTANGLEMENT

22–51. This entanglement (fig. 290) consists of three rows of medium pickets, a horizontal wire along the top of each row, one diagonal wire in each of the two bays formed by the three rows, and, finally, loose wire thrown into the bays.

It is not a very effective entanglement; its chief value lies in the fact that it is not conspicuous. It is the slowest entanglement to erect at night, if screw pickets are used, as the latter are very hard to find. This difficulty can be overcome by laying down a spun yarn line or tracing tape.

DOUBLE-APRON FENCE

22–52. This entanglement (fig. 291) consists of four horizontal strands on the fence and three (including the trip wire) on each apron.

Belts of double-apron fences form an excellent framework for a wide obstacle; loose wire can be thrown in between the bays for thickening purposes.

PORTABLE WIRE OBSTACLES

22–53. These special forms consist of various different shapes of framework upon which barbed wire is strung. They are used:

(*a*) To block gaps in the entanglement.

(*b*) As an emergency obstacle thrown out in front of the trenches.

(*c*) To barricade narrow streets in defended villages and trenches leading toward the enemy.

(*d*) To make emergency repairs to entanglements partially destroyed by the enemy's fire.

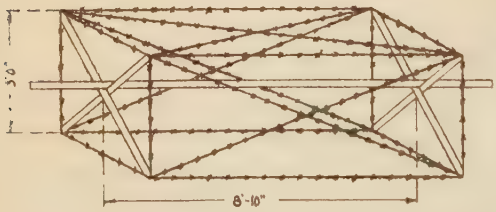


FIG. 284.—Large knife rest (wood)

22–54. The principal form of portable obstacle for use by infantry is the knife rest. This obstacle consists of a framework of wood or iron, upon which barbed wire is strung. The iron framework is collapsible and hence easier to transport than the wooden type; it has the further advantage of greater invisibility and strength. In shape the framework of the

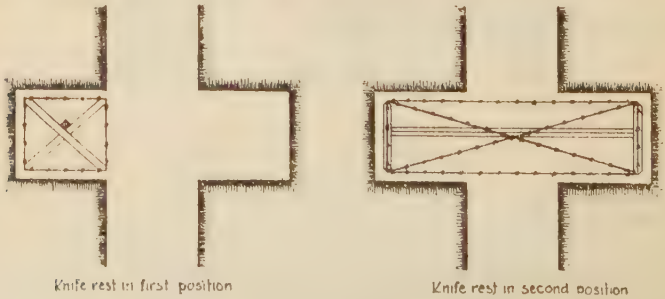


FIG. 285.—Method of blocking trench with knife rest

knife rest resembles a common sawbuck. It is the most used of the portable obstacles. (See figs. 284 and 285.)

Wire Drills

GENERAL RULES

22–55. The following general rules apply to all drills. (See figs. 290 and 291.)

A. **Order of work:**

In the following drills all men have been given a number and the several groups a letter; the tasks should be initiated in the order in which the men are numbered, and the groups should work in echelon in the same direction, so that the men doing different tasks will not be in each other's way and groups never cross paths.

FIG. 286.—Right and wrong way of running out a coil of barbed wire

B. **Pickets:**

(*a*) *Spacing.*—The p. o. determines the location of the pickets in one row by means of pacing; in the other rows the pickets are located by eye opposite the center of the intervals in the preceding row.

(*b*) *Laying out.*—Pickets should always be carried under the left arm and placed on the ground with the right hand and in such a way that the end of the screw or the point of the picket faces the enemy, indicating the spot at which the picket is to be erected.

(*c*) *Erection.*—Screw pickets must be screwed in so that the loops are parallel to the length of the entanglement and the top loop points in the direction from which the men are working, i. e., toward the starting point. This rule is essential in order to facilitate placing wires.

(*d*) *Anchor pickets.*—Wooden pickets used as holdfasts should be driven in roughly at right angles to the stay wire attached to them, but screw anchorage pickets must be directed in prolongation of the stay wire to avoid being drawn in the direction of the strain.

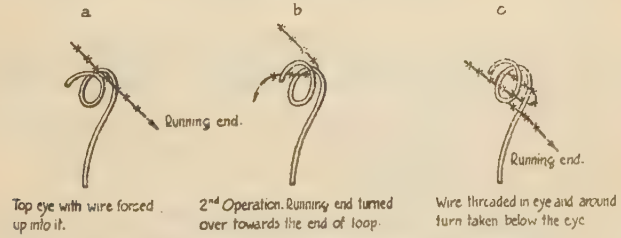


FIG. 287.—Method of fastening barbed wire on picket

C. **Running out wires:**

In running out barbed wire two men work together; one man holds the reel and the other stretches the wire and fastens it to the pickets. The stake on which the reel is carried must be small enough to permit the coil to revolve easily; and it must be so held that the wire runs from underneath the reel, as otherwise the wire tends to rise into the holder's face. (Fig. 286.)

D. **Fixing wires:**

(*a*) Men fixing the wires must always work facing the enemy.

(*b*) To fix wire in top eye of screw picket: Pull the standing end taut and slip the wire up into the eye; turn the running end up over the eye, thus threading the wire in the eye; then take a turn with the running end around the picket below the eye. (See fig. 287.)

(*c*) To fix the wire in lower eye of screw pickets when there is already a wire n the top eye:

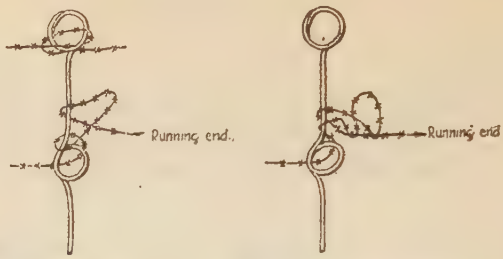


FIG. 288.—Method of fastening barbed wire on pickets

(1) Pull the standing end taut and slip the wire up into the eye. Then take the bight on the running end, pass it around the picket above the eye, then finish off by taking a turn with the bight on the running end. (See fig. 288.)

(2) If one eye is on the opposite side of the pickets from the others, the wire must be forced down into the eye, and the bight on the running end passed around the picket under the eye.

The above rules, (*b*) and (*c*), apply in which ever way the wire men are working, from right to left or left to right; if they are carried out, the wire is firmly fixed

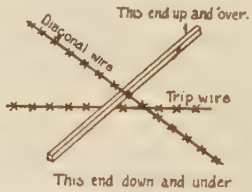


FIG. 289.—Windlassing wire

in the eye and can not slip up or down the picket; also, if one bay is cut, the wire in the bays on either side remains taut and does not slip through the eyes.

(*d*) To fix the wire to wooden pickets, take two turns around the picket, the second turn binding the first.

(*e*) To fix one wire to another adjacent to it, a short length of smooth wire may be used, or the two wires may be twisted together by means of a rack stick as shown in Figure 289. This method is known as "windlassing."

E. Loose wire and trip wire:

The addition of loose wire and a trip wire makes the entanglement more efficient. The organization of the wiring party is so arranged as to allow two spare men for this task. If circumstances require the omission of the trip wire and the loose wire, the organization of the rest of the party is not affected.

DRILL 1

22–56. *Drill for 50 yards length standard low (or knee-high) wire entanglements*

Materials:

(1) Nine bundles containing six medium pickets each.

(2) Two 100-yard coils and three 50-yard coils of barbed wire.

Tasks of wiring party

Group	No.	First task	Second task	Third task	Fourth task	Fifth task
P. O.		Direction and supervision				
A	1 2 3	Carry out 3 bundles pickets and 2 coils (100 yards) barbed wire.	Lay out and screw in center line of pickets.	Diagonal wire in enemy bay.	Diagonal wire in home bay.	
B	4 5	Carry out 3 bundles pickets and 3 coils (50 yards) barbed wire.	Lay out and screw in outer line of pickets.	Horizontal wire on outer line of pickets.	Horizontal wire on center line of pickets.	Horizontal wire on inner line of pickets.
C	6 7	Carry out 3 bundles pickets and 4 spirals.	Lay out and screw in inner line of pickets.	Loose wire in enemy bay.	Loose wire in home bay.	

(3) Four spirals.

Wiring party:

One p. o. and seven men. The p. o. carries cutting pliers, and each of the party a windlassing stick; gloves as required.

Carrying party:

One p. o. and 17 men.

Details:

(1) The p. o. leads out the whole party and has all his stores dumped in some convenient place behind or near the head of the task. Each group is responsible for its own stores as detailed above; A being the larger group will be ready first.

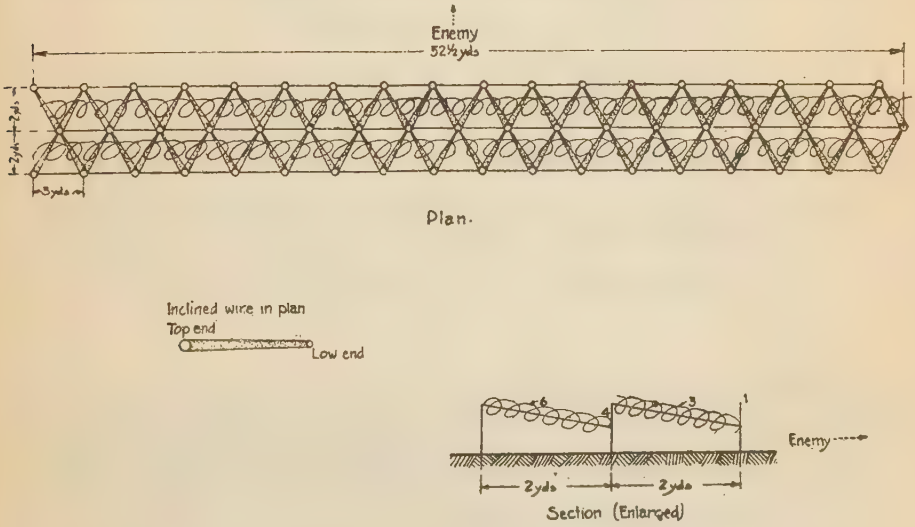


FIG. 290.—Order of putting on the wire

(2) When ready the p. o., followed by Nos. 1, 2, and 3, paces out the center line and indicates to No. 1 where to lay pickets. As soon as No. 1 has finished his bundle, he screws in 6 pickets. The p. o. follows the same procedure with Nos. 2 and 3, who complete the laying out of the center line.

(3) As soon as the p. o. has thus laid out his center line of pickets, he returns to the head of the task and supervises the laying of the outer and inner line of pickets by B and C groups.

(4) As soon as A group has finished its pickets, it returns to the head of the work and puts on the diagonal in the outer bay. No. 1 runs out the coil, No. 2

fixes the wire on the outer line of pickets, and No. 3 fixes the wire on the center line of pickets.

(5) As soon as B group has finished its pickets, it returns to the head of the work and puts the horizontal wire on the outer line of pickets; No. 4 runs out the coil, and No. 5 fixes the wire on the pickets.

(6) As soon as C group has finished its pickets, it throws the spiral wire into the outer bay, two spirals in each 50-yard bay.

(7) When B group has finished the horizontal wire on the outer line of pickets, it comes back to the head of the work and puts the horizontal wire on the center line of pickets. Similarly, A group and C group return to the head of the work and repeat in the home bay the operations described in (4) and (6).

(8) Finally B group puts the horizontal wire on the inner line of pickets.

DRILL 2

22–57. *Drill for 50-yard standard double-apron fence.*

Materials:

(1) Four bundles containing 4 (long) pickets each.

(2) Four bundles containing 8 anchorage pickets each.

(3) Fourteen 50-yard coils barbed wire (or two 100-yard coils) and ten 50-yard coils.

Wiring party:

One p. o. and 9 men. The p. o. carries cutting pliers, and each of the party a windlassing stick. Gloves are required.

Carrying party:

One p. o. and 15 men.

Tasks:

Group	No.	First task	Second task	Third task	Fourth task	Fifth task
P. O.		Direction and supervision				
A	1 2 3	Carry out 3 bundles pickets.	Screw in long pickets.	Front diagonal wire.	Bottom wire on fence.	Rear diagonal wire.
B	4 5	Carry out 2 bundles anchorage pickets.	Screw in front anchorage pickets.	Front trip wire.	Second wire on fence.	Top horizontal wire on rear apron.
C	6 7	Carry out 2 bundles anchorage pickets.	Screw in rear anchorage pickets.	Second horizontal wire on front apron.	Third wire on fence.	Second horizontal wire on rear apron.
D	8 9	Carry out 1 bundle of pickets and 14 coils barbed wire.		Top horizontal wire on front apron.	Top wire on fence.	Trip wire on rear apron.

Details:

(1) The p. o. leads out the whole party to the head of the work, and A, B, and C groups undo their bundles when ready. The p. o. paces out and indicates to A group where to lay its pickets, commencing with No. 1 and finishing with No. 3. Having done this, the p. o. returns to the head of the work, picks up the fourth bundle which D group has brought out, walks back again, and lays out this bundle; all numbers of A group, as they finish four pickets, join the p. o. and screw in the last four pickets.

(2) Meanwhile B and C group, getting the direction from the center line of the long pickets, lay out and screw in the whole of the anchorage pickets, No. 4 being responsible for the anchorage picket at the head of the work, and No. 7 for the anchorage picket at the end of the work. Each number of both groups lays out and screws in his own bundle of pickets.

(3) Meanwhile, D group brings out the remainder of the stores and dumps them at any convenient spot indicated by the p. o. This requires each man to make four journeys.

(4) As soon as A group has finished its pickets, it returns to the head of the work and puts on the front diagonal wire. No. 1 runs out the coil, No. 2 fixes the wire on the pickets, and No. 3 fixes the wire on the anchorage pickets.

(5) As B, C, and D groups finish their second task (see tasks), they return to the head of the work and put the horizontal wire on the aprons. Nos. 4, 6, and 8, respectively, run out the coils, while Nos. 5, 7, and 9 windlass the wires on the diagonal wire. In doing this Nos. 5, 7, and 9 should not step over the diagonal wire but walk around the posts, lifting their wire over the posts, and then down into position on the diagonal wire.

(6) As they finish each task, the various groups return to the head of the work and take up the next task in the order given.

All men work behind the wire at all times.

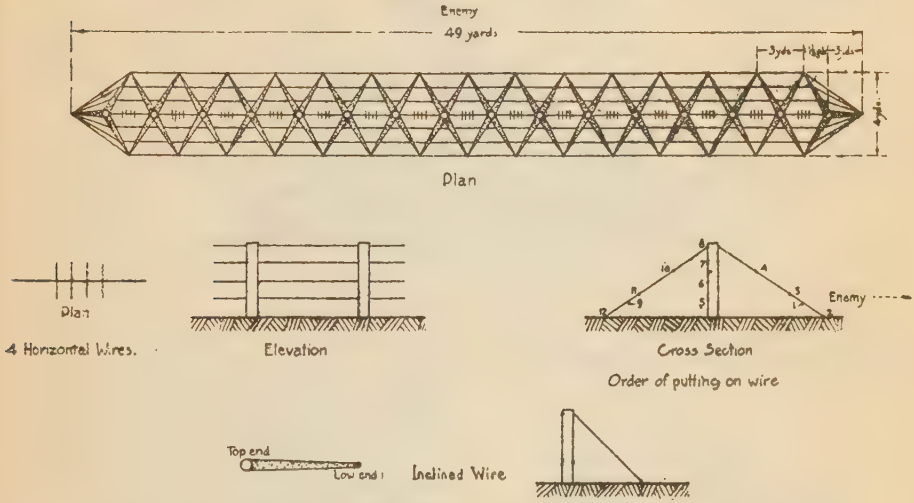


FIG. 291.—Fifty-yard standard double-apron fence

Nos. 1 and 2 must be careful to put the diagonal wire on rather slack; it automatically tightens when the horizontal wires are windlassed on.

All diagonal wires and apron wires are begun and finished on the end anchorage pickets. The horizontal strands on the fence are not carried down to the end anchorage pickets.

If wooden or angle-iron pickets are used, Nos. 1 and 2, and No. 3 and the p. o. work together, No. 2 and the p. o. holding up the pickets while Nos. 1 and 3 drive them in with the maul.

Section VII.—DEFENSE OF TOWNS AND VILLAGES

General Principles

22–58. Villages.—Villages of well-built houses can often be turned to excellent advantage for defensive purposes, and the issue of many important battles has depended on their capture. The outer buildings and inclosure walls facing the attack not only afford a strong firing line, but the interior and rear of the village furnish good cover for supports and reserves. An obstinate step-by-step defense can be arranged by the use of interior buildings and street barricades.

In preparing a village for defense, the strong main line should be provided along the outer edge by putting walls of buildings and inclosures in a defensible condition. If the village is subjected to artillery fire, the main line of defense should be placed in fire trenches a short distance in front of the outer line of the village with ample covered communications leading to the rear. The front lines should be divided into definite sectors of defense to which complete units, companies or battalions, are assigned. Interior lines of defense may be prepared along streets parallel to the front, and a final stand made in any strong central building in an open space, such as the church or courthouse. Machine guns can be used effectively from behind barricades sweeping the streets leading to the front. Good communications are an important feature in the defense of a village, and these should receive especial care, the necessary openings through walls

being provided for this purpose. Artillery for the defense of villages should be placed outside and to the rear of the flanks.

22–59. To occupy a village as a military post, the following general rules should be observed:

First select some suitable and substantial building as a stronghold, and determine whether it would be best to occupy the whole village, or a part only.

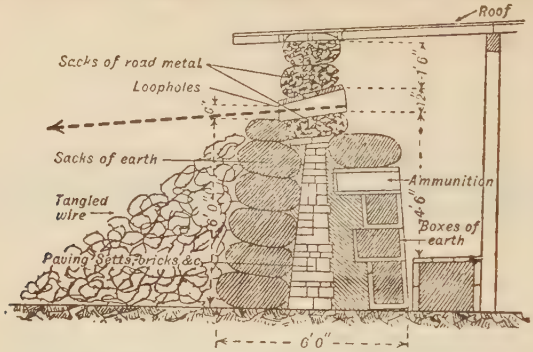
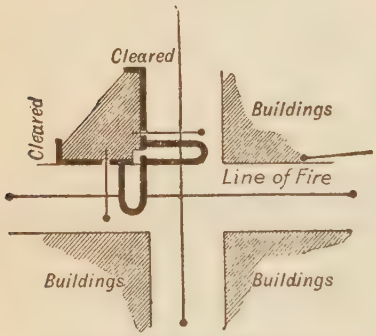


FIG. 292.—Obstructions: Defensive street barricades

Avoid wooden houses and thatched roofs, and prefer brick houses to those of stone, selecting such as mutually flank each other. Take care that the amount of ground occupied be not in excess of the number of men available for the defense. Salient points must be strengthened as much as possible; all houses not occupied by the defense which may be of the least use to the attack must be demolished. *Outside* the defenses, destroy all walls, thick hedges, and any cover which may be parallel generally to the place, and leave such as may be perpendicular to it, and which will therefore be enfiladed and cause obstruction. *Inside* the place, reverse this rule; *wet* ditches, palings, and thin hedges outside the place may be left. Hedges, walls, etc., may be incorporated with the general line of defense. Long walls may receive flank defense by means of *tambours* or projecting small angular stockade-works; communications may also be thus covered. The streets may be barricaded and the houses loopholed; great care must be given to the communications with the stronghold, and also that barricades be not in position to be taken in reverse; in this case other barricades must be formed in rear.



Arrangement of Street Stockades to fire four ways.

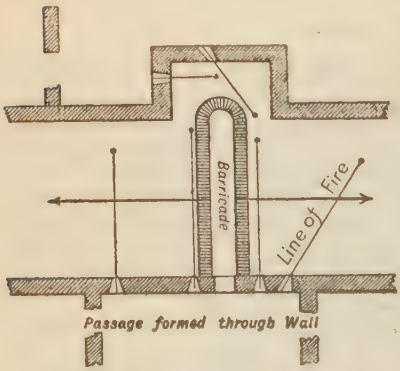


FIG. 293.—Defensive street barricades

22–60. It may be mentioned here that walls and buildings form a dangerous background for men close in front of them, on account of the ricochet from bullets which strike the wall and glance off; and *fire cover should never be made in such situations without an ample back parapet or parados of soft material.* Walls or houses should never be relied on as a position for the main firing line in any situation exposed to artillery fire. Their principal value is for the control of streets in the heart of a town, and other situations where they can not be located by the enemy's artillery.

22–61. Houses.—Loopholes should be made in the walls and at the angles. The upper windows need not be barricaded throughout, but must be so to a height of 6 feet from the flooring. Balconies may be strengthened and made bullet-proof, being loopholed at the base in order to give fire from beneath to the foot of the wall; suitable overhanging constructions of a similar nature may be formed by beams of timber, these being passed through the wall and secured inside to the joists of the flooring; it would be advisable to construct them over outer doors. Especial care must be given to the communications inside the building, staircases being partially removed and ladders substituted. If the outer wall be liable to be weakened by artillery fire, the flooring inside should be supported by stanchions.

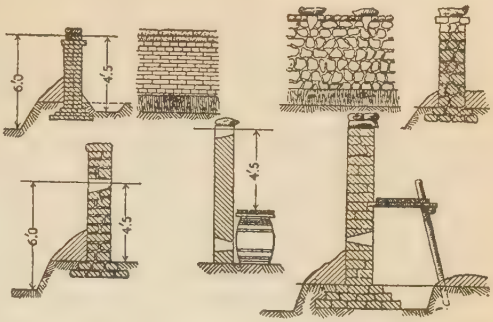


FIG. 294.—Methods of loopholing walls at various heights

Plenty of water must be available, in casks, etc., within the building. All windows and doors of the lower stories should be well barricaded and secured, and ditches cut around the house.

22–62. Figs. 295 and 296 illustrate particular examples of firing from behind the walls of houses. The occasions when it is permissible to make use of buildings

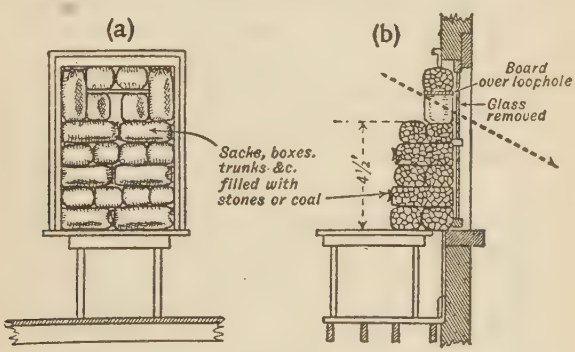


FIG. 295.—Window prepared for rifle fire

as fire cover have already been discussed. *As a general rule it will be quicker to make use of the existing openings—namely, doors and windows—than to cut fresh loopholes.* The treatment illustrated in these figures is applicable to either a door or a window.

In Fig. 295 a window opening is shown blocked with a pile of sacks, boxes, trunks, a chest, cupboard filled with bullet-proof material, with a loophole for shooting through. The *height* of the loophole opening is determined by the amount of depression required in firing. A *width* of 2½ to 3 inches will usually be ample.

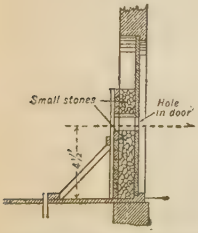


FIG. 296.—Door prepared for rifle fire. (Boarded up on inside)

NOTE.—If a narrower support than the table shown can be obtained for the sacks, etc., the rifleman can stand on the floor, and less material will be needed to provide cover.

22–63. In Fig. 296 a large gateway or door is shown boarded across on the inside, and the boarding shored up by struts which bear against a beam nailed to the floor, or if laid on the ground, kept in place by pickets driven behind it, and a bar above nailed to uprights, which in their turn support and strengthen the boarding. The hollow space between the boarding and the door, *which should not be less than 6 inches*, is filled with small stones, road metal, etc. Loopholes may be made of rough board similar in shape to Fig. 266. Windows may be treated in the same manner, the glass being first removed in all cases.

Section VIII.—DEMOLITIONS

22-64. The **demolition** of material objects forms an important accessory of tactical operations in war. It serves to hamper the movements of the enemy, to frustrate his plans, and, by the removal of obstacles, to facilitate the operations of our own forces. Demolition is permissible only as a military necessity and should be carried no further than military necessity demands.

In time of peace demolition may be used to prevent the spread of conflagration, or for similar purposes, where the value of the objects saved may greatly exceed that of the objects destroyed.

22-65. The **means of demolition** best adapted to military purposes are **fire** and **explosives; mechanical means** may also sometimes be used. Which of these is best in a given case depends on the circumstances. If time permits and there is little danger of fire spreading farther than intended, it is easier and simpler to burn docks and buildings than to use explosives. Explosives are specially suited for destroying iron and brick structures, or masonry bridges, etc. Again, a timber bridge will fall if cut, and explosives furnish a means for doing this without being on it at the time; but if not pressed for time burning is as good, or better.

Destruction by mechanical means is too simple to require and too varied to permit detailed description. Where absolute destruction is required, as in case of food supplies, munitions of war, structural materials, etc., fire is the only recourse.

22-66. Demolitions by the landing force are not likely to be extensive. Where explosives are required, the outfit is largely improvised from the charges of the naval defense mines that ships carry. Where much demolition work has to be done, dynamite or ordinary blasting powder can probably be acquired for that purpose. These materials, though not suitable for carrying on shipboard are so widely used that they are cheap and readily obtainable in large quantities.

Trinitrotoluol, being a service explosive, may perhaps be used for demolition work. Loose T. N. T. can be made up in sausage form, in bags of light duck, and is very convenient in that form. Wire nails can be safely driven through it to attach such tubes around timbers in an encircling chain, and the detonators stuck in through slits made with a knife. These tubes are convenient to carry; they can be cut to desired length with a knife, and the ends tied with twine after dumping a little out. In blowing up flat shapes a primer on each side should be used to insure good detonation, particularly if the tube is thin.

22-67. The **strength** of the various types of explosives differs somewhat, both with their nature and with the means of detonation. But for the purposes of the landing force, all forms of high explosive, such as dynamite, T. N. T., gun cotton, etc., may be considered as having equal strength, if a suitable detonator is used. Gunpowder requires at least four times as large a charge as does high explosive.

22-68. Detonation.—Explosion is produced by detonation, for which purpose a small cap or detonator of fulminate is inserted in the charge,[1] called a **primer.** The charge of fulminate in commercial caps varies from 8 to 30 grains, according to size. Wet guncotton requires also a dry guncotton primer. Both cap and primer must be kept dry.

The cap may be fired by means of a powder fuse or by electricity. The latter is the preferred method, but requires a magneto-electric exploder and lead wires. If these are not available the fulminate may be ignited by means of a powder fuse. Two classes of fuse are employed, known as time and instantaneous. They are distinguished by the color of their wrappings and by a frapping thread wound on the instantaneous fuse so that it may be distinguished by touch at night from the time fuse. Normally the color of the envelope of the time fuse is black; that of the instantaneous fuse, red.

Time fuse burns at the rate of about 3 feet per *minute;* instantaneous fuse, 120 feet per *second* or more. Caps and fuses must be kept away from other explosives.

The detonator is stuck in one end of a stick and the ends of the wrapper tied around with twine. The leading wires (if used) are given a hitch around the stick to keep a strain from pulling out the detonator. The detonator should be located as near the center of the mass of the charge as convenient.

22-69. Safety precautions.—Priming charges and detonators should not be put in before necessary, the firing connections should be made only after all is clear; and explosives should not be exposed to sparks or fire or handled roughly. All safety precautions are merely these statements in various forms.

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[1] Very powerful caps are required for T. N. T. to obtain proper detonation.

There are, however, a few things that may be added to the above, that one's caution would not of itself suggest. The principal of these is the behavior of dynamite in cold weather. Dynamite comes in sticks, usually paper covered. It is a mixture of nitroglycerine and "dope," sometimes inert, but more usually explosive. Sticks should be stowed horizontally to prevent exudation. In cold weather it freezes and gets hard. It has to be thawed to restore sensitiveness. This should be done either in a special hot-water heater or in a box packed with manure, and should not be hurried, for if overheated or roughly handled during this thawing process it is very sensitive. It may be frozen inside while soft on the outside. In working with dynamite and handling it one gets a "nitroglycerine headache." Strong coffee or aspirin cures it.

22–70. Charges should be tamped in some manner whenever this is practicable, as their effect is thereby greatly increased. (With low explosive, tamping is essential.) Timbers should be bored to receive the charge if time and facilities permit. Charges placed to destroy concrete, steel, etc., should be tamped with earth or mud. It is the inertia of the tamping material that counts, and a plank with dirt on it laid over the explosive is quite effective. Earth tamping of a charge along the foot of a wall should be about 1½ times as thick as the wall for maximum effect. If tamping is impracticable, the charge must be increased.

Skill in placing the charge will greatly increase its effect. Several small charges judiciously distributed will often produce better results than one large charge, but care must be taken to produce simultaneous detonation.

Reconnaissance

22–71. In the case of an important demolition **a reconnaissance or examination** should, if practicable, be made to determine the extent of the destruction required and the easiest, surest, and most expeditious manner of accomplishing it with the men and equipment available. The damage inflicted should be sufficient for the purpose in view and no more. Thus, **if the purpose is merely to delay** for a short period the use of a certain bridge, it may be sufficient to remove the deck instead of destroying the trusses. A telegraph line may be temporarily interrupted by cutting or grounding the wires, but for complete demolition further measures are necessary.

22–72. A structure that is to be demolished should be attacked at its **weakest point,** or the point where the least time and effort in the way of demolition will require the greatest time and effort to repair the damage. Thus, in the case of railroads, which are frequently attacked, it is easier to demolish a bridge than to tear up track; but is much more difficult to repair the damage to the track than to repair a small bridge. It is as easy to remove a rail on a curve as on a tangent, but it takes more time to prepare and place a curved rail.

Methods Employed

22–73. The following notes will indicate the methods employed in some of the important military demolitions.

(1) All **timber structures** may be destroyed by fire. For rapid work they may be sprinkled with coal oil, tar, or other inflammable liquid before ignition.

(2) **Framed structures** of wood or steel may be destroyed by attacking the weakest member of the framing. Thus in a truss bridge the chords may be cut at their thinnest points.

(3) **Bridges** are most effectively demolished by overthrowing their piers or abutments, which wrecks the entire structure. The most vulnerable points of roads and railroads are the important bridges or viaducts.

(4) **Railroads** may be attacked at culverts and tunnels. If these vulnerable points can not be reached, railroads may be interrupted by removing rails or cutting them with explosives, preferably on curves. A fire is made of the ties, the rails placed therein, and twisted while hot. An entire section of track may be removed by opening the joints at each end, loosening the ballast, and then overturning the section. This method may be executed quickly, takes considerable time to repair, and does not injure the track material. It is best to select an embankment and throw the loosened section down the slope. Railroads may also be crippled by removing or wrecking the rolling stock, expecially locomotives, or by demolishing switches and water tanks. It is generally better to wreck the road at several points rather than to concentrate the work of destruction in one locality.

(5) **Highways** are very difficult to destroy, but the passage of vehicles may be interrupted by digging trenches across them, by firing land mines in the surface, or filling deep cuts with debris.

(6) **Buildings** may be demolished by closing all openings and firing a large charge in a central position.

(7) **Telegraph lines** may be interrupted by cutting the wires, but for complete demolition the poles should be cut down and burned, which also destroys the cross arms and insulators. At stations the instruments are removed or demolished and the records seized.

(8) **Woods** are rendered useless for cover by burning, or by cutting down the trees with tools or explosives, then lopping off the branches and throwing them into ravines. The trunks may be left on the ground, and it is neither necessary nor practicable to remove the stumps, as it takes too much time.

(9) **Masonry arches** may be attacked by explosives at the haunches or crown. In a multiple arch bridge the destruction of a pier involves the two adjacent arches.

(10) **Locks** are rendered useless by destroying the gates or filling valves.

(11) **Supplies and materials** of all kinds are ordinarily destroyed by fire, after sprinkling them with inflammable liquids, or mixing inflammable and non-inflammable materials.

(12) **Obstacles placed in front of the trenches** are very difficult to destroy. They are often demolished by shells and grenades, but such methods are slow, expensive, and unsatisfactory. Wire entanglements may be cut with nippers.

22–73½. The **proper charges of explosives** to accomplish certain results have been determined by experiment. The tables serve as a useful guide, but can not entirely take the place of experience and good sense. For detailed information see Engineers' Field Manual, U. S. Army.

Summary of Charges for Demolitions

22–74. The following table[1] gives approximate charges to be used for the different kinds of structures to be demolished. The formulæ apply for *dynamite, guncotton,* or similar *high explosive.* The charges are assumed to be *well placed, but untamped; if well tamped* the charges may be reduced one-third. When prepared in great haste in the presence of the enemy, *increase the charges one-half. Gun powder* requires charges four times as great, and *must be tamped.*

Object	Pounds	Remarks
Hardwood trees, round (encircling charge)	$5\ T^2$	Also piles, masts, etc.
Hardwood beam, rectangular (encircling charge).	$3\ BT^2$	B=longer side of cross section.
Hardwood stockade or barrier (single charge)	$3\ BT^2$	B=length of breach; T=maximum thickness of stockade.
Hardwood tree, round (auger-hole charge)	$\frac{3}{8}\ T^2$	T=Smallest diameter of tree; hole bored radially, so that center of charge shall be at center of tree.
Earth and wood stockade or barrier	4 per foot	This is for breastworks 2 to 3 feet thick, made of earth rammed between planks or railway sleepers.
Brick and masonry revetments	$\frac{1}{4}\ BT^2$	Charge placed behind revetment against its back surface; for scarp walls of forts and surfaces of tunnels.
Detached masonry or brick wall (less than 2 feet thick).	2 per foot	Placed against the wall in close contact.
Detached masonry or brick wall (over 2 feet thick).	$\frac{1}{2}\ BT^2$	Placed against the wall in close contact.
Masonry piers of bridges	$\frac{2}{3}\ BT^2$	Placed against the pier in close contact.
Masonry arches of bridges	$\frac{3}{4}\ BT^2$	Placed along the crown of haunches.
Heavy gates	50 pounds	Gates of forts, armories, etc.
Iron rail stockade or barrier	7 per foot	This is made of iron rails, touching each other, placed in ground on end.
Iron plates, wrought or steel	$\frac{2}{3}\ Bt^2$	t=thickness in inches. Laminated plates same as solid.
Steel rails	$\frac{2}{3}$ pound	Lashed tightly to web of rail.
Field or siege-guns, medium caliber	1½ pounds	Placed on the chase near the muzzle.
Large seacoast guns	4 pounds	In bore tamped from the breech and muzzle with sand or earth.
Inflammable buildings or materials may be ignited.	1 disk of dry guncotton.	Disk should be simply ignited, not detonated.

T=thickness in feet of object to which charge is applied.
t=thickness in inches of object to which charge is applied.
B=length in feet of breach to be made in object; if weight of charge per running foot is desired, make B=unity in formula.

[1]Adapted from Military Explosives; Weaver. Published by John Wiley & Sons.

Section IX.—CAMOUFLAGE

General

22–75. Military camouflage is work done for the purpose of deceiving the enemy as to the existence, nature, or location of our troops, matériel, or military works.

The enemy may be deceived by—

(*a*) Making an object look like something else.

(*b*) Making an object indistinguishable from its surroundings.

(*c*) Suppressing all signs of human activity near the object, or deceiving the enemy as to the purpose of this activity.

(*d*) Erecting dummies.

22–76. The necessity for camouflage and the methods employed will vary widely with the situation. In stabilized warfare the most minute precautions are necessary, while in open operations time will not be available either to the defense for taking such precautions nor to the offense for making the minute studies required, and the constantly shifting character of operations will greatly decrease the value of many of the precautions indispensable in position warfare. In open operations camouflage against aerial photography falls off greatly in importance; the main effort should be directed to concealment from ground observation. The employment of dummy works designed to deceive the enemy as to the location of the more important works and centers of resistance is an especially effective form of camouflage in open warfare.

22–77. When taking up positions in open warfare, natural and artificial cover (embankments, ditches, road cuts and fills, villages, woods, hedges, vegetation, etc.) are utilized to the fullest extent as means of concealment from observation.

22–78. In stabilized warfare the camouflage erected must be proof against the following means of observation:

(*a*) Air photographs taken either from directly overhead or obliquely. These are minutely studied by specialists trained to detect and interpret the faintest marks on the photographs.

(*b*) Direct observation from the ground, from captive balloons, or from low-flying airplanes. This is most important in order to prevent spotting of shots by enemy artillery observers.

The camouflage of an entire trench system or even of considerable lengths of trench is impracticable and should not be attempted. Effort should be directed toward camouflaging the more important works (e. g., machine-gun emplacements, dugouts, combat emplacements, etc.) with a view to concealing from the enemy the method by which the position is held.

22–79. While there is some difference in the way in which a camera records a picture and the way in which the eye records it, it is usually safe to assume that perfect camouflage against air photographs will also be perfect camouflage against direct observation, excepting the close observation which is possible on works in or near the front line. In the latter case greater attention must be paid to the choice of color, so that the eye will be deceived, and to the placing of the camouflage so that observers on the ground can not see underneath.

22–80. Before locating any military work which is to be camouflaged, a careful study of the air photographs of the locality should be made. When practicable, the location of the work should be such as to make the camouflage as simple as possible. Subsequent photographs should be studied, so as to correct the camouflage.

22–81. Camouflage must be done well, as poor camouflage is usually worse than none at all.

Camouflage is a continuous process and must be constantly maintained. Frequent inspections must be made and injuries repaired. On account of the inflammable nature of much of the material used in camouflage work, it must be carefully protected against fire.

22–82. Dummy works include dummy trenches, false entrances to shelters, trails, piles of excavated material, etc.

Principles of Camouflage

22–83. The form of an object is its most dangerous element. Anything rectangular or regular in shape arrests attention. Nothing in nature appears regular, consequently anything that is regular must be the work of human hands. Regularity is manifested in two forms:

(*a*) In the shape of the camouflage and the shadow.

(*b*) In the regular spacing or alignment of similar works.

22–84. The shape of the camouflage must not be such as to form a geometrical figure when viewed from a considerable distance. A line such as the edge of a saw may appear broken to close view, but perfectly straight from a short distance. In broken country, camouflage of fantastic shape readily escapes detection, and even in the open, fantastic shapes given to the solid parts of camouflage screens may stave off suspicion.

22–85. A peculiar shape, which might escape notice if it occurs only once, will undoubtedly receive attention, if repeated a few times at regular intervals. Regular spacing should, therefore, be carefully avoided.

22–86. Shadows may reveal the existence and form of an object, and the problem of camouflage is to avoid such shadows. If the object can not be screened so as to eliminate the shadow, the latter should be made vague and indefinite. For this reason, camouflage screens are of irregular density, being thinned out near the edges.

22–87. Texture is a quality which can be compared to the lay of the nap of cloth. It is determined by the amount of shadow of each separate element which makes up the surface. Texture causes tall grass to photograph dark, short grass lighter, and flattened grass very light. This quality is difficult to estimate, but if incorrectly estimated, it will cause artificial material to contrast with its surroundings.

22–88. Footprints made by men walking about in the vicinity of camouflaged works are the principal signs by means of which the enemy discovers the presence of the work. The reason for this is that the footprints photograph very light because of the fact that they have changed the natural texture of the surface. Every officer and soldier should be impressed with the fact that footprints about any piece of camouflage will certainly lead to its discovery. Carelessness in this respect is a serious breach of discipline and materially interferes with the success of military operations.

22–89. Colors should be matched as closely as possible, but a slight difference in color between the camouflage material and its natural surroundings is not very noticeable. Objects viewed from directly or obliquely overhead may show a different color than when viewed from the ground. For example a field of young corn will appear green when viewed from the ground, because only the corn is seen, while from above, it will appear brown, because the earth between the cornstalks shows up prominently.

22–90. Camouflage must be made to conform to changing seasons, principally by changing its color. Complete conformity can not always be attained, but by some repainting by introducing new patches of color and by the use of local materials, old camouflage can be kept up well enough to escape detection. When snow falls, camouflage which shows up must be covered with snow or with pieces of white cloth, painted with pale blue patches. Usually, only small sections need to be thus treated. Blast marks, trails, and roofs of dugouts must be especially watched.

22–91. To avoid tracks:

(*a*) Use existing roads and paths wherever possible.

(*b*) Build new roads and paths under cover using natural cover as much as possible.

(*c*) Carry new roads and paths past the position to another road, a house, or a dummy position. Make sure that the road is used past the true position.

(*d*) Make the roads and paths follow existing lines, such as fences, hedges, ditches, edges of plowed fields, etc. Keep the roads narrow and avoid cutting corners.

(*e*) Hide the trail under a horizontal screen, 9 to 12 feet wide, with thinned edges, making use of hedges or similar lines.

(*f*) Confine traffic to one route. Keep this route narrow, and keep traffic on the route by the free use of trip wires.

22–92. The principal camouflage materials are sod, shrubbery, branches, raffia on wire netting, painted canvas screens.

22–93. Camouflage of machine guns must be kept as small as possible, and the soil from the excavation must be disposed of so that it need not be camouflaged.

Forward machine guns are usually hidden behind plaster and burlap fronts, imitating earth or sandbag parapets, piles of stone, the face of a stone wall, etc., with a view to concealment from direct ground observation. The loophole should be covered by a hinged flap, which is opened only during firing.

Positions farther in rear are hidden by a light rectangular frame, covered with wire netting camouflage (grass or raffia), and capable either of moving up and down vertically, or hinged at the rear so that it will open like a trap door when the gun is to be fired. Small fish nets (10 feet by 10 feet) form a convenient and portable camouflage for machine guns. In favorable terrain, machine-gun positions may be disguised as piles of débris, road metal, broken timbers, etc.

22–94. *Short lengths of trench* may be hidden by using painted scrim or cocoanut matting. The edges of the camouflage must be broken, and the camouflage covers must not be allowed to sag.

Wire entanglements, otherwise well concealed, are sometimes recognized by paths following the wire to a gap. The formation of such paths should be prevented by trip wires.

Permanent snipers' posts require a hole for observation, which is usually covered by gauze, and a hole for firing, which should be of an irregular shape and located in a natural shadow.

Snipers' heads are used in order to spot the location of enemy snipers. They should be fastened so that they can slide up and down in a fixed frame. When an enemy sniper shoots into one of these heads, the head is lowered, and the direction from which the shot came determined.

22–95. Care should be taken to avoid betraying the location of the work by committing the following errors:

(*a*) A large amount of camouflage material has been prepared, but the work is begun before the camouflage is put in place.

(*b*) A work is well camouflaged; but depots of material are left unconcealed near by.

(*c*) A shelter is very carefully concealed, the excavated material is carried away at great pains, but a periscope is left unconcealed, or smoke issues from the interior, etc.

(*d*) A trail terminating at a command observation post is used for approaching the post.

(*e*) Men observe from the open near a post.

(*f*) Men do not keep concealed but move about when a hostile airplane is overhead.

Section X.—PIONEER PLATOON

22–96. The pioneer platoon will be instructed in all the duties that may be required of other pioneer troops. Especial attention will be devoted to the construction of shelters, observation posts, command posts, concrete emplacements, demolitions, and minor stream crossings.

In addition to the instruction necessary in preparation for the execution of its own peculiar duties, the pioneer platoon should serve as a regimental center of instruction in infantry pioneer service.

Chapter 23

MEDICAL TACTICS ASHORE, FIELD HYGIENE, SANITATION, AND FIRST AID

(Prepared under the direction of the Bureau of Medicine and Surgery)

A. Medical Tactics on Shore

Section I.—GENERAL

23–1. A medico-military department is designed and organized to **assist the combatant branches to attain their objective.** To accomplish this requires a mutual and common understanding of its proper mission.

23–2. The primary mission of the medical department is the "conservation of physical power" which is accomplished by two major procedures, viz, (*a*) prevention of disease and injuries, and (*b*) treatment of diseases and injuries.

23–3. Medical arrangements must conform to the plans of the combatant units. The following instructions are presented as a general guide to fit the majority of occasions. They must not be considered as mandatory, nor as preventing responsible authorities from departing from them whenever special situations so demand.

23–4. **Before landing.**—The medical officer should make a physical inspection and eliminate the unfit; examine and replenish field medical supplies, if necessary; make an estimate of the situation and formulate a tentative outline for the organization and functions of the medical department; study the regulations and instructions for landing force; study combat orders. The medical officer should be able to interpret a military map. (For concise information on this subject refer to Chapter 24.)

The medical plans should be based upon a careful study of the proposed landing operations as furnished by the unit commander, who should be consulted with a view to ascertaining the best manner of supplying prompt medical, surgical, and hospital assistance to the sick and wounded.

If time permits, instruction should be given to the landing force on first-aid measures and field sanitary precautions. The stretcher bearers should be specially instructed and trained in the transportation of the wounded.

23–5. **Embarkation and landing.**—The company's hospital corps men should embark with their respective companies. This method will insure prompt first aid, and at least some collection of the wounded from the very beginning.

The force on landing should carry the lightest equipment possible, the packs being carried in the hand on embarking and debarking.

There is great danger of accidental discharges of firearms among landing troops, as is well illustrated by the following incident: Out of 22 cases of wounds among the landing party in Guantanamo Bay, Cuba, on June 11–20, 1898, 9 were due to accidental discharge of their own rifles and 1 was caused by the premature discharge of a comrade's rifle. Medical provisions should be made to care for such contingencies.

The stretcher men and remainder of the medical department should embark in a special boat flying the Red Cross flag.

23–6. **Sick call.**—Morning sick call will be held by each regiment. Men wishing to answer sick call will be assembled by a petty officer of each company, their names listed and given to the regimental surgeon or his representative.

23–7. **War diary.**—Each medical officer should keep a war diary of the major events coming under his cognizance.

Section II.—MEDICAL ORGANIZATION FOR LANDING FORCE

23–8. (*a*) One hospital corps man, lower rating, for each company (not to exceed 1 for each 150 combatants).

(*b*) The battalion medical detachment:

1 battalion surgeon.
1 pharmacist's mate (chief or first class).
2 pharmacist's mates (second or third class).
Stretcher bearers—totaling not less than 2 per cent of the strength of the battalion.

(*c*) Regimental medical department:
1 regimental surgeon.
1 assistant regimental surgeon (if regiment is operating independently).
2 hospital corps men (1 chief or first class, and 1 lower rating).
2 to 4 battalion medical detachments.

(*d*) Brigade medical organization:
1 brigade surgeon.
1 pharmacist.
2 or more regimental medical departments.
(The total number of hospital corps men should approximate 2 per cent of the strength of the landing force.)
1 supporting hospital on shore (to be equipped from hospital ship or combatant ship).
1 brigade surgeon (additional duty).
1 executive surgeon.
1 advanced hospital on shore:
2 junior medical officers.
1 dental officer.
1 chaplain.
1 pharmacist (additional duty).
1 chief pharmacist's mate.
2 pharmacist's mates (first or second class).
8 lower ratings.

(*e*) Base hospital:
Hospital ship, or other vessel designated to accommodate wounded.

23–9. Medical combat stations.

Medical station and location	Composition	Function	Suggested equipment (Field Supply Table, 1923)
Company aid post (directly to rear of company).	Company's hospital corps man.	Apply tourniquet or compress to wound; dress wound; improvise immobilization for fractures; prevent lightly wounded from leaving firing line; direct ambulant wounded to battalion dressing station.	Individual carrying device (items No. 1, extra splints; No. 2 canteens).
Battalion dressing station (300–500 yards behind firing line).	Battalion surgeon 3 hospital corps men, stretcher bearers (2 per 100 combatants).	If necessary, redress, resplint, and retag; morphine, A. T. serum; hot stimulants and liquids; blankets; prompt evacuaction.	Individual carrying devices; battalion medical and surgical cases; chest, battle dressing. Items Nos. 1, 2, 3, 6, 7, and 9.
Regimental medical headquarters.	Regimental surgeon and assistants.	Tactical only, except when regiment operates separately; when regiment establishes a small rear hospital, cares for casualties in regimental headquarters.	Equipment similar to above
Supporting hospital	3 to 4 medical officers, 1 pharmacist, 1 dental officer, 1 chaplain, 11 hospital corps men.	Combat shock; rest, food, surgical assistance; evacuate to hospital ship, or other hospital base.	(Items 1 to 31—carried by hospital ship.)
Base hospital	Hospital ship or other designated vessel.	Furnishes "Definitive treatment" to the wounded.	Equipment as supplied.

23–10. Evacuation.—If the lines of communication are short, the ordinary field litter carried by two stretcher bearers will suffice. If the lines of evacuation are long, four bearer carriers must be resorted to.

Pack-animal and animal-drawn, or motor, transportation may be commandeered shortly after landing and devoted to evacuation purposes.

23–11. The following are some of the fundamental principles of evacuation:

1. The medical personnel must remain with the unit to which attached and serve it during battle.
2. Contact is established and maintained from rear to front.
3. A unit evacuates casualties no further to the rear than its own station.

Section III.—FORCE SURGEONS

23–12. The force surgeon.—Refer to article 14–18 for an outline of the duties of the force surgeon.

23–13. The regimental surgeon.—The regimental surgeon shall prepare for the regimental commander of landing parties such sanitary, hygienic, and hospital regulations as may be required, and shall submit such recommendations as he may deem necessary for the preservation of the health of the command. He shall advise the regimental commander regarding the organization and equipment of the ambulance parties of the several battalions, and shall submit recommendations for instruction in first aid and for the drill of stretcher men. He shall, if necessary, establish and assume general charge of the regimental aid station, and shall make all arrangements for the transportation of sick and wounded from the battalion aid stations.

Taking average conditions, of all casualties sustained, 15 per cent will be killed outright; 45 per cent, constituting the slightly wounded, will be able to walk back to hospital stations; and the remaining 40 per cent, constituting the moderately and severely wounded, will require transportation, half of them sitting and the other half prone. Of the 20 per cent of battle casualties classified as requiring transportation in the prone position, 8 per cent, constituting the most severely wounded, are nonevacuable and must not be transported beyond the field hospital, but the remaining 12 per cent, after proper preparation, can be transported with safety to the base hospital.

The surgeon shall inspect and assume general charge of all personnel assigned to the regimental medical department. He will designate the medical and surgical outfits to be landed in any instance, regarding which he will advise the battalion surgeons, and he will report to his commanding officer the transportation required for the medical department personnel and material.

23–14. The battalion surgeon.—(*a*) The battalion surgeon shall make such suggestions and recommendations to the battalion commander and keep such records as may be necessary. He shall take the initiative in providing for all details.

(*b*) The battalion surgeon shall organize and instruct the assigned personnel. He shall assist the regimental surgeon in carrying out the general plans for the care of sick and wounded and for the preservation of health.

(*c*) He shall establish an aid station as near to the firing line as practicable and keep his commanding officer and the regimental surgeon informed of its location. If it becomes advisable to change the location of the battalion aid station he shall promptly notify the above officers of such changes. Copies of such messages should be retained. He shall also adopt such measures as may be necessary to redirect stretcher bearers and wounded to the new location.

(*d*) He shall see that all men are equipped with the first-aid dressing and that a resupply is available.

(*e*) He shall arrange for the transportation of sick and wounded from the firing line to the battalion aid station.

23–15. Company hospital corps man.—One hospital corps man of the battalion medical department shall be assigned each company, and shall be designated as the company's hospital corps man. This hospital corps man shall accompany the company into action and shall establish the "local aid post" on the firing line. He shall direct the ambulant noneffectives toward the battalion dressing station and shall return effectives to the firing line. He shall apply the first dressings when necessary; use tourniquets or bandages for the control of hemorrhages; temporarily immobilize fractures, and prepare patients for transportation.

Section IV.—HOSPITALS

23–16. Supporting hospital.—(*a*) The establishment of supporting hospitals in the rear of the landing force will be determined by the size of the force, length of the lines of communications, anticipated strength of the opposition, and the availability of a ship or hospital ship to act as a base hospital for the care of patients.

(*b*) When a brigade is landed, the hospital ship should establish a supporting hospital ashore—this ship furnishing the necessary personnel and field equipment. If the hospital ship is not present, the medical department of the fleet flagship should improvise a small hospital ashore, when the conditions demand it.

(*c*) If the landing force consists of a regiment, a regimental infirmary should be established in support of the battalion dressing stations, if the conditions demand the same.

(*d*) The supporting hospital should be under the direction of the brigade or force surgeon.

23–17. A ship as base hospital.—A ship will be used as a base hospital whenever practicable and, the sick and wounded should be sent on board as promptly as possible, in order to relieve the advanced hospital force and to avoid hampering the movements of the landing force.

Section V.—STRETCHER BEARERS

23–18. Stretcher bearers.—(*a*) The stretcher bearers are a part of the battalion medical detachment, consisting of men assigned by the commanding officer who have had special instruction and training in first-aid procedures and transportation of the wounded. The medical equipment for these men will be furnished by the battalion surgeon. One stretcher will be provided for each pair of stretcher bearers. If the lines of communication are long, four bearers will be needed. One man of each pair of stretcher bearers will carry an electric flashlight to assist in locating the wounded at night.

(*b*) Stretcher bearers should total not less than 2 per cent of the number of combatants landed.

23–19. Additional stretcher bearers.—During an engagement any men who are not actually engaged in their own legitimate duties may be employed to reinforce the stretcher bearers and when so employed they should lay aside their arms and wear the red cross badge to conform to the regulations of the Geneva and Hague conventions.

23–20. The medical department on the march.—Before starting, medical officers should see that all sick and unfit are eliminated and that the camp site is left in a sanitary condition; also that the quality of water in the canteens is satisfactory and that foot disorders have been given requisite attention.

1. The brigade surgeon: The brigade surgeon proceeds with the staff of the brigade commander.

2. The regimental surgeon: The regimental surgeon is with the regimental staff. The assistant regimental surgeon marches with the regimental medical detachment.

3. The battalion surgeon: The battalion surgeon marches with the staff of the battalion commander. The assistant battalion surgeon marches with the battalion medical detachment. If there is only one surgeon assigned to a battalion, he should march with his detachment.

The junior medical officers marching in the rear should occasionally proceed up and down the marching column of their organizations and carefully observe the condition of the men.

Men suffering from effects of fatigue may be dropped at the march collecting stations, ride in available vehicles, or they may be allowed to march without their equipment—which may be carried by one of the wagons of the train. All sick and injured patients should be properly tagged with the diagnosis tag and recorded. A compilation of these records is made at the end of the day's march

B. Field Hygiene and Sanitation

Section I.—INTRODUCTION

23–21. The medical department can not successfully accomplish its mission—the conservation of man power—without the proper cooperation of the individual officers and men of other branches of the naval service.

23–22. The question of the proper care of men in the field involves certain overlapping functions of the unit commander and the medical officer. The following instructions are presented as a general guide in field hygiene and sanitation. In almost every campaign disease has killed four times as many men as the weapons of the enemy. In the World War the death rate from disease was lower and death rate for battle higher than in any previous American war. In

the American Expeditionary Forces there were over twice as many battle deaths as deaths from disease.

23–23. The following shows the number of deaths per year for each 1,000 of the United States Army.

	Death from disease	Killed in battle
Mexican War (1846–1848)	110	15
Civil War, Federal forces (1861–1865)	65	33
Spanish War (1898)	26	5
World War (1917–18) (American Expeditionary Forces only)	19	53

Note the progressive decrease in the death rate from disease since the Mexican War due to advances made in preventive medicine and field sanitation, the results being due largely to the control of insect and water-borne diseases. In the recent war respiratory disorders were responsible for the majority of deaths from disease. In the total American forces—at home and abroad—influenza and pneumonia caused more deaths than the weapons of war.

23–24. The care of men is one of the most important functions of military officers. To accomplish this successfully requires a knowledge of the basic laws of health and the fundamental principles of sanitation. Commanding officers are responsible for the proper enforcement of sanitary and hygienic measures. The medical officers act primarily in an advisory capacity.

23–25. The average daily rate for those on "sick list" in the command will normally be 1 per cent. In addition there will be carried in the field hospitals or hospital ship 1.5 per cent. There will be on the excused list, but available for light duty, probably 0.5 per cent, which will make a total noneffective rate daily of 3 per cent.

23–26. **Battle casualties.**—The following estimates as a guide for expected casualties are based upon the average casualties of the American Army forces in France. The average daily losses in battle will be about 8 per cent and in a front line regiment about 12 per cent. Therefore, for purposes of computation, the average casulaties for one day's battle may be set at 10 per cent of the total force.

In open operations the ratio of killed to wounded will be 1 to 6; in trench warfare it may be 1 to 4.

Section II.—HYGIENE OF THE MARCH

23–27. The ability to march has always been one of the determining factors of victory. Superiority in marching enables the commander to secure preponderance of men at the critical time and place.

23–28. Infantry is still the dominant arm in spite of the rapid development of the other branches of the military service. Artillery without the support of infantry is vulnerable.

23–29. In modern warfare use has been made of mechanical transportation to effect great concentrations of men, but, usually at the last moment, due to congestion of the arteries of traffic and to other causes of impassability of the roads, there is a call for a test of physical endurance in marching.

23–30. **Preparation for the march.**—The men should be trained in marching by increasing the length of the hike and the weight of the pack. They should be so trained for several months. In preparing for the Battle of the Somme on March 21, 1918, the Germans concentrated their troops by maneuvering them into position by long marches. For several months previous the German divisions were trained to endure long marches, and only five days before the battle many of the troops were far from the battle field and some covered 60 miles in three nights of marching preceding the battle.

This training means the development of all the muscles in the body—an increase of the capacity of the lungs and heart, also strengthening of the foot arches. It is at this time that the medical officer should keep close supervision over the men. Overtraining defeats our purpose and leads to cardiac dilatation and eventually to exhaustion.

There should be periods of mental and physical relaxation and recuperation.

It is remarkable how rapidly the human mechanism develops with progressive and systematic physical exercises. The raw recruit under proper supervision shows rapid development with a few months of training.

23–31. Start of the march.—The most suitable time to start a day's march is one hour after the break of day. Night marching should only be practiced when military necessity demands and then should begin soon after sunset.

The canteens should be filled preferably the night before the march. The sick and physically unfit should be eliminated at the morning sick call.

A light breakfast is served—consisting of bread, oatmeal, tea or coffee, and perhaps some bacon.

When the men "fall in" there should be no delay in getting started, as standing around is especially fatiguing.

The sanitary officer, with a police detail, remains for a few minutes after the camp is cleared to see that all waste and litter is disposed of and that the camp site is otherwise left in a clean and sanitary condition.

The March

23–32. Length.—The length of the day's march is not measured by miles but according to the condition of the roads, the weather, the pace, the weight of the loads, experience, and physical condition of the men. Under average conditions 10 to 12 miles constitutes a day's march for a division or a brigade, and 20 miles per day may be regarded as a forced march.

23–33. Rate.—The march should start with a slow rate of speed until the body is warmed to the point at which muscular action is most efficient.

The rate of a day's march should average not more than 2½ miles per hour (inclusive of halts). To maintain this speed one hundred and twenty 30-inch paces are required per minute, which gives an actual rate of 3.46 miles per hour (exclusive of rest periods). This may be regarded as the most economical speed for experienced men; for unseasoned men and for long hikes the most economical speed is a somewhat slower cadence than the above.

23–34. Halts.—The first halt should be after 30 minutes of marching, and should be for a period of 15 minutes' rest. The object of the first halt is to permit the men to get their "second wind," adjust shoe laces, rearrange packs, and to attend to the calls of nature.

The succeeding halts are made every 50 minutes and are for a period of 10 minutes' rest, except the halt for the noon meal, which is for one hour.

During the rest periods the men should remove their packs and lie upon their backs. Their coats should be replaced and rebuttoned to avoid undue exposure to drafts and winds. An endeavor should be made to halt in cool and shady places, protected from strong winds. A place should be provided for the men to attend to the calls of nature during the rest periods—shallow trenches dug with a bayonet or sharp stick will suffice for this purpose.

23–35. Formation.—If there is much traffic on the road, the marching column should keep to the right and, perhaps, proceed in squad formation. If the circumstances permit, it is much better to march in open ranks—half on each side of the road, which tends to decrease the heavy devitalizing cloud of dust, foul odor, and water vapor from perspiration—crowd poisoning—which tends to hang over close-order formation.

The march should be at "route step," thus permitting the men to take the length of step most adaptable to their physique. In order to vary the monotony of the "route step" marching, it is advisable occasionally to march "in step" for short periods.

The taller men at the head of the column are apt to set a pace difficult for the shorter men marching in the rear of the column. It is also easier marching at the head than in the rear, consequently the column should be reversed from time to time. The rear files, as a rule, expend about 6 per cent more energy than those at the head.

23–36. Meals.—A noonday meal is served when the day's march is two-thirds completed. The cooks should have some warm soup or coffee prepared to serve to the men when they arrive in the evening camp.

The main meal of the day is the evening meal, which is to be served about an hour after the march is completed.

23–37. Morale.—A fatigued body causes a hypersensitive state of mind which is more susceptible to any real or imaginary adverse stimulus. To inhibit the action of these stimuli, resourcefulness and leadership in company officers are

required. One company under proper leadership will arrive in the evening camp tired but happy, whereas another company not so skillfully led is apt to come into camp tired and disgruntled.

Singing and whistling of popular tunes should be encouraged, as this distracts the mind of the men from their fatigued state.

Straggling either from poor discipline or fatigue is always to be avoided, as it is depressing to the morale of the entire command.

23–38. Clothing and equipment.—The maximum weight that a man can carry without serious loss of efficiency is said to be about 30 per cent of his body weight. The weight of a pack and equipment is about 50 pounds.

The equipment should be so arranged as not to restrict the expansion of the chest, as this interferes with the action of the heart and lungs.

It is advisable in warm weather to unbutton the front of the shirt and to roll up the shirt sleeves.

23–39. Water discipline on the march.—Marching, like other general muscular exercise, tends to elevate the body temperature, and an elevation of 1° to 3° may be regarded as normal for the marching man. In order to maintain the body at a constant temperature, there must be some means of losing the heat which is generated by the contraction of the muscles used in walking. Nature makes provisions for this loss of heat by three methods, viz, evaporation, convection, and radiation.

To furnish a supply of water to take the place of the fluids lost in evaporation the marching man must consume a definite quantity of water.

The quantity of water necessary to replace the above loss has been carefully worked out for average conditions of temperature and humidity. For 3 miles, or one hour of marching, he will require 540 c. c. of water, which is a little more than 1 pint (473 c. c.), and for two hours of marching each man will lose 2 pints of water, or the equivalent of 1 canteen of water.

It has been demonstrated that trained men can lose as much as 6 pints of water from the body and that untrained men can lose at least 2 pints without causing any serious discomfort. Consequently, it is a safe rule to permit men to lose 2 pints of water by evaporation before resorting to their canteens for drinking water.

Under average climatic conditions the first drink of water should be at the end of about two hours of marching.

Here the man should sip slowly one-half the contents of his canteen (1 pint) and, thereafter, 1 pint for every hour of marching, inclusive of rest periods.

On hilly or muddy roads and under tropical conditions this allowance should be increased materially.

A marching man will evaporate approximately 1 pint of water for every hour of marching (inclusive of rest), and this appears to be a safe rule to follow.

In addition to the amount of water consumed from the canteen, a pint or more is consumed with each meal.

The experienced man will instinctively determine the amount of water which his system will require; it is the raw recruit who is apt to "water log" his tissues, sweat profusely, and tire easily.

One type of thirst is due to dryness of the mouth. To overcome this condition the men are advised to chew gum or keep pebbles in their mouth to promote the flow of saliva.

Smoking on the march tends to increase thirst and should be limited to rest periods, or, as some authorities recommend, it should be prohibited during the march.

If possible, men should be accompanied by water carts containing potable water. It is most important that only pure water be used in the canteens.

The water needs of officers are slightly less than those of men, because their equipment is lighter, and marching to one side requires less work than marching in ranks.

23–40. Selection of a camp site.—Toward the end of a day's march a line officer, a medical officer, and a supply officer should ride forward and select a camp site, unless this has been previously arranged for.

It is difficult to locate an ideal camp site which will be entirely satisfactory from a sanitary viewpoint. In time of war tactical considerations are of primary importance in the selection of a camp site.

23–41. Points to be considered in determining the location of a camp.—

Favorable considerations	Unfavorable considerations
1. Accessibility to a supply of good water, fuel, and forage.	1. Sites recently occupied by other men, allowing two months' vacancy as an arbitrary standard.
2. Sandy loam or gravel.	2. Dry bed of river, ravines, and base of hills, if there is a likelihood of rain.
3. Elevated site, well drained, such as sloping plateau.	3. Clay, alluvial, or dusty soil.
4. Shade trees, as a protection from the sun's rays in warm weather.	4. Proximity to marshes, swamps, and other mosquito-breeding areas.
5. Hills and forests acting as windbreaks in cold weather.	5. Steep slopes.
6. The location selected should be large enough to accommodate the command.	6. Sites where the ground water is near the surface.
7. Grass-covered location.	7. Proximity to native habitations, especially in malarial regions.

Section III.—FOOD IN THE FIELD

23–42. Diet.—In the service the diet is determined and prepared for the men so that the individual has little or no means of obtaining the articles of food which his system may crave. This is particularly true of conditions in the field. This explains why we should pay detailed attention to the food issued in the field, in order to prevent diseases caused by a deficient diet.

The vegetables for stews should be cooked separately and not longer than 30 minutes; then they should be added to the meat, which requires about 2 hours of cooking. Avoid the use of alkali, e. g., sodium bicarbonate, when cooking green vegetables, as this tends to destroy the vitamins.

British troops in Mesopotamia—eating white bread—suffered from beriberi, while the Indian troops—eating unmilled wheat—escaped. During the seige of Kut the reverse was the case—the British living largely on fresh meat, while the vegetarian Indians lived largely on white bread.

During the late war an outbreak of scurvy occurred in the British Army among the men of the South African Labor Corps. Without the alteration of their diet, the period of cooking was reduced from 6 hours to 45 minutes and the outbreak was immediately arrested.

The vitamin-containing foods of a military ration should weigh at least 30 per cent of the total.

The field ration should contain canned tomatoes and lemons, oranges, or limes, when obtainable. Potatoes should be cooked and served unpeeled, to supply additional vitamins. Fruits and vegetables which are to be eaten raw and unpeeled should have the exterior surface sterilized by momentary immersion in boiling water whenever there is suspicion of contamination.

Every effort must be made to vary the field diet, changing the food substances as well as the manner of cooking.

The guard at night should have coffee and bread before going on duty, and this should also apply to relief parties.

When on the march or otherwise heavily worked, the men will have a craving for sweets; a liberal amount of jam or other sweets should be provided to satisfy this craving.

The presence of much refuse food in the garbage can is a good indication that the men are not receiving the proper kind of food or that it is not palatably served.

In the field a percentage of the rations is issued in tin containers. This, due to improper preparation, exposure to excessive heat, and lack of care in handling, may undergo decomposition, and is especially dangerous to health if its use is permitted in this condition. Therefore, a careful inspection of all canned goods should be required.

23–43. Washing mess gear in the field.—After meals all mess gear should be sterilized in boiling water. In a semipermanent camp the mess gear may be placed in wire racks and washed by immersion for five minutes in water that is kept boiling.

On the march and under conditions where the mess kits from the haversack are in use, the following method of washing the individual mess gear is employed: Immediately after the men have finished eating they should form a line and pass a garbage can or pit where the refuse liquid and solid food is disposed of. After disposing of the refuse each man inserts his mess gear successively in three cans. These are placed over a trench in which a fire is burning. The first and second cans contain boiling soapy water, while the third can contains boiling clear water. A few moments' insertion in each of these cans is usually sufficient to cleanse the utensils. After insertion in third can the mess gear dries by its own heat almost immediately and no wiping is necessary. Care should be taken to see that the water in each can is kept at the boiling point.

23–44. Field kitchen.—The field kitchen should be located on the opposite side of the camp from the latrines and urinals. Some means should be available to protect the food from dust and sand. If circumstances permit, the kitchen should be screened; if not, other precautions should be taken to protect food from flies and other insects. Burlap sacking may be used for purposes of screening food supplies when other material is not available.

There should be a sufficient supply of pure water on hand at all times. A supply of material for cleaning purposes, such as soap, soda, soap powder, scouring material, boiling water, and clean dishcloths, should be available.

The floor of the kitchen may be oiled to allay dust.

The cooks and other attendants working in the kitchen and handling food should be instructed in personal hygiene. Rigid supervision is necessary to prevent the cooks from becoming lax in personal cleanliness, especially in keeping the hands and finger nails clean.

Physical examination of all food handlers should be made at regular intervals, and, if the laboratory facilities permit, an effort should be made to detect and eliminate any disease carriers among them.

Liquid and solid refuse should be disposed of as soon as practical. The outside of all garbage cans should be kept clean and the cans should be kept covered at all times.

The object of all cooking processes is:

(*a*) To make food more digestible and appetizing.

(*b*) To destroy germs and parasites.

23–45. Mess tents.—The mess tents should be located near the kitchens. Make the necessary provision to protect the food from flies, dust, and sand, using wire screening if available.

Clothes and toilet articles must not be stored in kitchens or mess tents.

Section IV.—WATER

23–46. Source.—Fresh water exists in nature as (*a*) rain, hail, and snow; (*b*) surface water—pools, ponds, lakes, rivers, and streams; (*c*) ground water—wells and springs.

Rain water is seldom available for military use in the field. In using water from lakes it is advisable to take water at some distance from the shore. The proximity of human habitation may determine the purity of water for drinking purposes.

23–47. Contamination.—All water in the field should be regarded as contaminated until proved otherwise.

Water may be contaminated during distribution and storage, as well as at its source.

23–48. Purification.—In sedimentation—by letting water stand for a considerable period of time—much of the suspended matter, including bacteria, is deposited. This method is unsafe and requires time.

Improvised filters may be used. A pit may be dug at the side of the river where the bank is composed of sand and the water allowed to percolate through. A barrel filter may be constructed.

Heat is one of the safest measures to sterilize water, but it requires time and fuel. Water should be boiled for 20 minutes and allowed to cool.

Water receptacles should be well covered. As the ground in close proximity is likely to be wet, it is best to build a sand or gravel pit 2 feet square and 1 foot deep to absorb the waste.

The receptacles should be cleaned daily with boiling water or rinsed with a solution of potassium permanganate (one-third of a teaspoonful of potassium permanganate to 1 gallon of water). A solution of chlorinated lime is also very good for this purpose in the proportion of 1 to 1,000. These solutions are harmless and more certain in their action than boiling water used alone.

Canteens when not in use should be emptied, dried, and cleansed with one of the above solutions. Weak tea has been highly recommended for drinking purposes in canteens; it should be boiling hot when poured in, thus insuring the sterility of the canteen as well as of the contents.

Common drinking cups should not be used. If individual drinking cups can not be supplied "lip drinking" should be practiced by holding the edge of the cup beneath the lower lip. Should conditions arise which make is absolutely necessary to use common drinking cups a certain degree of safety can be insured by keeping the cup immersed in a solution of formalin (1 per cent).

Chlorination is extensively practiced to-day. Chlorinated lime (bleaching powder) is the substance used, and is found on the Supply Table of the Medical Department. A simple formula for its use is as follows:

Dissolve 1 level teaspoonful of chlorinated lime taken from a freshly opened container in 1 quart of water and label this "stock solution." This solution deteriorates rapidly and a fresh solution should be prepared every fourth day.

One teaspoonful of this stock solution added to each gallon of water and allowed to settle for 30 minutes should destroy disease germs. The proper proportion of free chlorine should be checked by the orthotolidine test.

23–49. The Lyster bag may be obtained from the Quartermaster's Department, United States Marine Corps. This bag consists of a round canvas sack 28 inches in length and 20 inches in diameter, weighing about 7½ pounds, and may easily be folded for field carriage.

The purpose of this bag is not to transport water in the field but to provide a means of sterilization and a stationary container for the water which is distributed from the faucets attached to the lower part of the bag.

The capacity of the Lyster bag is 36 gallons, which is sufficient to fill the canteens of 100 men.

A tripod formed by three litters makes a very good support for this bag. In the absence of litters a tripod may be formed from boughs of trees or iron pipes.

Water which is obtained from muddy streams or pools must first be cleared before chlorinated lime is added. This is accomplished by allowing the water to stand for a certain period of time, or it may be cleared by filtration, for which purpose a blanket may be used.

23–50. Calcium hypochlorite is the chemical used for water chlorination in the Lyster bag, and is supplied by the Quartermaster's Department, United States Marine Corps, in small glass tubes, each tube containing 15 grains (1 gram).

1. Break a tube of chlorinated lime and place the contents in a canteen cup containing just enough water to form a paste.
2. After forming a paste the canteen cup is nearly filled with water and the calcium hypochlorite is dissolved by stirring well while adding the water.
3. Empty the solution into the bag full of water.
4. Wait 30 minutes before using the chlorinated water. The proper proportion of free chlorine should be checked by the orthotolidine test. If test indicates insufficient chlorination (see method of test below), continue to add tubes of calcium hypochlorite (chlorinated lime) until free chlorine is present, as shown by test or by the taste of the water.

Chlorine will generally kill all germs in water in strength of about 1 part in 1,000,000, provided the water does not contain an excessive amount of vegetable matter.

For ascertaining whether sufficient free chlorine is present in the water the orthotolidine method is recommended.

Take 8 drops of orthotolidine solution (0.1 per cent orthotolidine in 10 per cent of hydrochloric acid solution) and add this to one canteen cup three-fourths full of the water from the Lyster bag to be tested. If free chlorine is present in the proper proportions the water in the canteen cup will assume an orange or orange-red color. A lemon-yellow color indicates that there is insufficient chlorine present.

As an emergency substitute for calcium hypochlorite or chlorinated lime, 10 c. c. (2½ teaspoonfuls) of the official tincture of iodine may be added to the contents of the Lyster bag; then wait 30 minutes before using the water.

Two drops of tr. iodine added to a canteen full of water will sterilize the contents.

Potassium permanganate, ½ grain to the gallon, may be used.

23–51. Water protection.—Horses should be watered below the place where men obtain drinking water and above bathing and washing places.

The following designations may be used:

White flag—to denote places to obtain drinking water.

Blue flag—to denote place for watering animals.
Red flag—to denote washing or bathing places.
Place guards at water supply immediately after entering camp.

23–52. Water requirements.—For permanent camp, 50 gallons per capita per diem.

In temporary camps, 5 gallons per man and 10 per animal.

On march and bivouac, 1 gallon per man for cooking and drinking and 4–10 per animal, depending upon weather.

As a minimum allowance for drinking purposes allow 3 pints per man per day.

23–53. Summary.—1. Regard all water in the field as contaminated unless proved otherwise.

2. Do not let the men fill their canteens from any unauthorized source.
3. Place a guard at the source of the water supply to prevent its pollution.
4. Water discipline on the march should be rigidly enforced.
5. Remember that not only the quality but the quantity of water supply should be supervised by the medical officer.
6. The amount of water lost by evaporation and otherwise by a man marching for one hour, or 3 miles, is nearly 1 pint.
7. The results obtained by modern military organizations demonstrate that water-borne diseases are preventable.
8. The prevalence of a water-borne disease in a camp indicates a weak link in the chain of sanitary measures.

Section V.—DISPOSAL OF WASTE PRODUCTS

23–54. Ultimate disposal.—The ultimate disposal of waste products in the field is confined to two procedures, viz,

A. Burial.
B. Burning.

Burial is the method usually employed in temporary and semipermanent camps, while in more permanent camps incineration of waste products is more often used.

23–55. Camp refuse.—The refuse which tends to collect in the company streets and environs should be collected and disposed of.

Metal garbage cans, if obtainable, should be placed at intervals in the camp for the deposit of waste paper, burnt matches, cigarette stumps, fruit peelings, etc. Wooden or cardboard boxes may be so employed.

Fig. 297a—The "Lucas" and "Back to Back" modification of straddle trenches

23–56. Excreta.—When a marching column halts a sanitary detail should prepare temporary latrines. A few narrow trenches dug with a bayonet will suffice.

In temporary camps—1 day to 2 weeks' occupancy—the so-called straddle latrine—also known as the 1, 2, and 3 latrine, can be used—the dimensions being 1 foot wide, 2 feet deep, and 3 feet long. Dig them parallel and pile the dirt at one end for the men to cover their dejecta with.

In semipermanent camps—2 weeks to 1 month's occupancy—covers can be constructed for straddle latrines.

In permanent camps—over 1 month's occupancy—deep latrines with fly-proof cover should be used.

23–57. Site and number of latrines.—Latrines should (*a*) be located at least 100 feet from the camp. Deep closed latrines may be at a distance of 50 feet. (*b*) They should be placed on the opposite side from the galley and kitchen, and (*c*) so located as to drain away from the water supply. (*d*) They should be placed at a safe distance from ditches and gulleys so as to avoid the overflow which might be caused by a heavy rainfall. (*e*) Separate latrines should be constructed for officers.

The seating capacity of the latrine area, as given by various authorities, ranges from 5 to 15 per cent of the command, depending upon the conditions. For commands on the march, stopping for only one night in camp and breaking camp shortly after breakfast, a latrine frontage of 1 yard for every 10 men is not an excessive allowance. It is not always practical to construct this number, and under such circumstances the medical officer should be satisfied with a 6 to 8 per cent frontage, using the latter figure for commands under 500. In a semipermanent camp estimate one seat for every 15 men.

23–58. Care of the latrines.—When deep latrines are filled to within 3 feet of the surface with excreta they should be covered in with earth and abandoned. The covered latrine should be labeled with an "L" if practicable. This marking serves to warn future occupants of the site.

The inside of deep trench latrines should be darkened by the use of tar paper or other available black material. Flies avoid dark places. The inside should be burned out occasionally with kerosene or crude oil.

In order to prevent the egress of any fly larvæ which may develop in the depth of the latrine and burrow through the ground around the mouth of the pit, an area of about 4 feet around the pit should be covered with crude oil or a 5 per cent cresol solution. A better method is to cover the area with burlap sacking soaked with crude oil.

It is very desirable that some provision be made for the men, especially cooks and other food handlers, to wash their hands after using the latrines. Sufficient toilet paper should always be available.

In order to prevent the possible flooding of latrines by storm water, a shallow trench should be dug around the area occupied by the latrine.

Latrines should be surrounded by a canvas screen or a screen made of shrubbery.

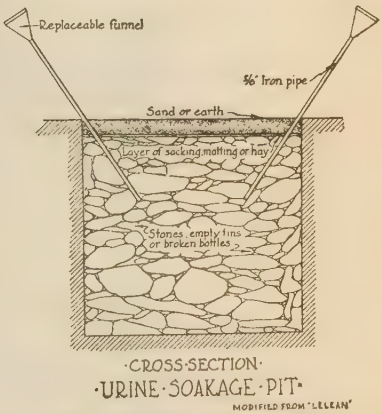


FIG. 297b.—From "Sanitation in War," by Lelean

23–59. Liquid waste.—Soakage pits are intended for the disposal of liquid wastes, kitchen sewage, and wash water. They are especially useful in camps of a permanent nature.

23–60. Urinal soakage pits.—The urinal soakage pit is constructed as follows: Dig a pit 4 feet square by 4 feet deep, fill to within 6 inches of the surface with large stones or empty perforated tin cans, and insert four pieces of iron pipe 4½ feet long, one at each corner. Cover stones with oil-soaked burlap sacking and fill the rest of the pit with earth. Tin funnels are fitted into the ends of the iron pipes (fig. 297b). In the absence of iron piping or funnels these can be improvised from empty kerosene cans, or tar paper may be used for the purpose. In a porous soil a urinal soakage pit will dispose of the urine of 100 to 200 men for an indefinite period of time.

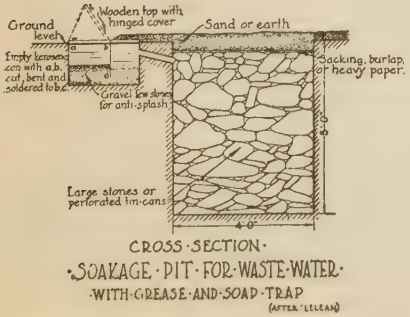


FIG. 298—From "Sanitation in War," by Lelean

23–61. Sewage pit.—Dimensions of this pit are the same as for the urinal soakage pit. They are also built in the same way, except they are fitted with "traps" to remove the grease by running the sewage through a box of gravel (fig. 298).

23–62. Wash-water pit.—Pits for wash water are built similar to sewage pits. The gravel will "trap" the soap.

23–63. Night urinals.—Urinal cans should be placed in the company streets at night, with a lighted lantern to mark the location. If placed at some distance from the camp it is a temptation for a man wishing to relieve his bladder during the night to urinate on the ground in the vicinity of his tent. The cans which are used for urinals should be cleaned and sunned during the day.

23–64. Incineration.—Refuse which is to be consumed by fire should be burnt in field incinerators, of which there are several types.

FIG. 299.—Caldwell incinerator

Caldwell incinerator (fig. 299): This is the name applied to two trenches dug at right angles to each other, intersected in the center. The dimensions are: Length, 6 feet; width, 1 foot; depth, at the center, 1 foot. There is a gradual slope upward from the center to the surface at either end. A chimney is improvised at the center by using a barrel and covering its sides with clay; scrap iron may be utilized for building a grate and stones for lining the sides of the trenches. The wooden barrel is burnt out, leaving a clay chimney. A garbage can with large performations in the bottom may be used as a substitute for the barrel and clay.

Rock-pile incinerator (fig. 300): Dig a circular pit 15 feet in diameter and 3 feet deep; line the pit with bowlders or mashed tin cans. In the center of the pit raise a pyramid of stones about 5 feet high, which will serve to create a draft. A fire is built around the pyramid and the garbage is later thrown on stones where the solid matter is consumed and the liquid is evaporated by the hot stones.

One cord of wood will consume about 4,000 pounds of ordinary camp refuse after the stones have been heated.

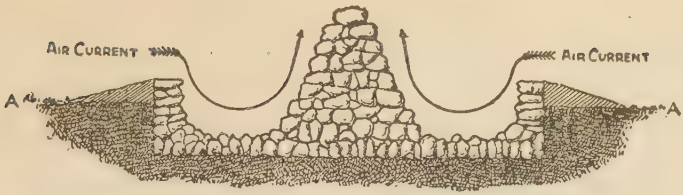


FIG. 300.—Garbage incinerator or crematory. (Mason.)

Section VI.—FIELD MEASURES FOR INSECT CONTROL

23–65. The human race is at constant warfare with hordes of insect enemies which frequently act as carriers of myriads of invisible foes—disease germs and eggs of parasites. This is especially true of conditions in the field, and for a landing force to withstand successfully the attacks of insects requires detailed consideration of field measures for insect control.

Common insects concerned in disease transmission

Common name	Genus	Common diseases transmitted	Breeding places	Life history	Range of flight
Flies	Musca (M. domestica).	Typhoid fever, cholera, dysentery, diarrhea, and other infections.	Manure, garbage, decaying organic matter.	Eggs hatch in about 36 hours to larvæ. Larvæ grow rapidly and in 7 to 10 days become pupæ (resting stage). In 2 to 4 days mature into adults.	½ to 1 mile.
Mosquitoes	Anopheles	Malarial fever	Rural stagnant pools, swamps, and marshes.	Eggs deposited in mass of 100; in 2 to 4 days hatch into larvæ, and in a week reach pupæ or wingless resting stage. In 2 or 3 days develop wings and become adult mosquitoes.	½ mile.
Mosquitoes	Aedes (A. Aegypti).	Yellow fever and dengue.	Domestic; develop in water in any container near a house or in gutters, cisterns, spouts, etc.	Lays about 70 eggs. Larvæ hatch out in 2 days and develop into pupæ in 1 week. Then in 2 or 3 days become mature adults.	Maximum of 75 yards.
Lice	Pediculus (P. vestimenti).	Typhus fever, relapsing fever.	Breed and spend their entire life on warm-blooded animals, including man.	Eggs cling to hair or clothing of host (man). They hatch out in 3 to 4 days and mature in 10 to 15 days.	Do not travel much; keep close to one host.

23–66. Measures undertaken to combat flies may be divided as follows:

1. Prevention of access.
   (*a*) Food protection.
   (*b*) Personal protection.
2. Destruction of the adult fly.
3. Prevention of breeding.

(*a*) Filth attracts flies. Cleanliness may be considered, in a negative manner, as the chief deterrent to the presence of flies.

It may be accepted as an axiom that an undue number of flies is indicative that food or filth is present somewhere in the vicinity.

A marked reduction in the number of flies around a kitchen may follow the simple measure of cleaning the outside of garbage cans.

(*b*) In a permanent camp the kitchens, mess halls, and garbage cans should be screened. In a semipermanent camp screening may be impractical; consequently we must depend upon cleanliness and insect-proof containers. Leaking

screens (especially cracks around the screen door) frequently convert the building into a huge flytrap—flies are able to gain entrance into the building through leaking screens but are unable to get out.

Screen doors should be made to open outward and should be in direct sunlight, when practical.

4. Repellents. The use of essential oils is unsatisfactory. Crude oil may be used around latrines to repel flies, and coating the interior of latrines with black material serves the same purpose.

23–67. Destruction of adult flies.—Solutions of formaldehyde, 1 per cent (corresponding to 2.5 per cent of a 40 per cent solution of formalin) or sodium salicylate, 1 per cent, will kill flies. As flies usually drink in the early morning, it is well to prepare the above solutions the night before.

A bucket containing about 1 quart of gasoline may be placed under flies at rest on the walls and ceiling of living quarters; the fumes of the gasoline will stupefy them, causing the flies to drop into the bucket.

2. Fly paper is very efficient and may be prepared as follows: Heat powdered resin 8 parts and castor oil 5 parts (by weight); stir well while heating; the mixture should not be brought to a boil. In hot weather the proportion of resin should be increased. Sugar or honey may be added, but is not essential. The fluid is spread while hot over glazed paper. The mixture may be painted upon iron hoops or wire strands. Wires so painted should be cleaned and recoated every two to three days.

23–68. Prevention of fly breeding.—Flies breed in horse manure, excreta, decaying organic matter, etc. One neglected stable may supply a horde of flies for an entire district.

Garbage should be kept in covered containers to prevent fly breeding, and should be removed frequently, especially in warm weather.

The suppression of flies resolves itself simply into a matter of cleanliness.

Grease traps must be kept covered and the surroundings kept clean and dry or larvæ will develop.

If horses are in use, the picket line should receive attention. Daily removal of the manure with cleaning and burning over the area are only partially effective measures in the prevention of fly breeding. The heat of burning over the surface only penetrates from 1 to 2 inches of the ground and fails to kill the developmental forms which may be several feet beneath the surface. Digging up the picket line and saturating it with crude oil and tamping it down gives fairly satisfactory results.

23–69. Mosquitoes.—The field measures undertaken to combat transmission of disease by the mosquito are as follows:

1. **Medicinal prophylaxis.**—The routine administration of quinine as a prophylactic against malaria will retard infection and conserve man power. The treatment of native malarial carriers is an important factor in the protection of the landing force.

2. **Personal protection.**—Kerosene is extensively employed in some of the tropical countries as a repellent to mosquitoes. The essential oils, such as oil of citronella, are also used (1 part of oil of citronella to 4 parts of vaseline). These oils have little practical value in the field, as their effect will not last through one night.

Screening of living quarters in permanent or semipermanent camps may be utilized by using wire mesh having 18 meshes to the inch.

The female malarial mosquito feeds at night; consequently sleeping nets are our best means of preventing the transmission of this disease in the field. Mosquito nets may be obtained from the Quartermaster Department of the Marine Corps and should be supplied to every individual of an expeditionary force, if possible. All sentinels after sunset in a malarial country should wear head nets and gloves.

3. **Mosquito destruction.**—The adult mosquitoes may be killed by fumigation—burning 2 pounds of sulphur, if available, for each 1,000 cubic feet of space.

Mim's culicide consists of equal parts (by weight) of phenol crystals and gum camphor. The phenol is slowly melted and poured over the camphor, forming a clear, volatile liquid. Volatilize by heating 3 ounces of this mixture for every 1,000 cubic feet of space.

Mosquito traps and swatters may be used. Destruction of the wintering adults is effective.

Destruction of mosquito breeding places.—Mosquito-breeding places may be controlled by oiling. Crude petroleum is the oil usually selected. When the mosquito larvæ, commonly called wiggletails, come to the surface for air the oil clogs their breathing apparatus and kills them by asphyxiation.

About one-half ounce of oil suffices for every square foot of water surface under normal conditions, e. g., small areas where the wind does not blow the oil aside. The application of this amount of oil once a week is sufficient to destroy each crop of larvæ. It requires 10 or more days for the cycle from the egg to the adult mosquito.

The "Panama dripper" consists of an oil can with a faucet near the bottom which allows the oil to fall on the water, drop by drop (usually at the rate of about 30 drops per minute), and furnishes a means of continuous oiling of a running stream.

Drainage and filling are also efficient measures. Where the mosquito-breeding area is below sea level and can not be drained it may be flooded with salt water to prevent breeding. In other areas deep ditches may be used to reduce the water surface to a minimum, which may then be easily controlled by oiling.

Small areas of swamps, marshes, etc., may be filled in with dirt, ashes, etc.

A comparatively small amount of stagnant water will furnish sufficient breeding area to infest a camp with mosquitoes.

A camp located about a mile from a malarial mosquito-breeding area is considered fairly safe.

In the selection of a camp site one should endeavor to avoid the proximity of native habitations, as these dwellings are apt to harbor mosquitoes and also malaria carriers.

23–70. Lice.—Various methods are employed for delousing. N. C. I. powder is considered very efficient in the destruction of lice and consists of: Naphthalene, 96 parts; creosote, 2 parts; iodoform, 2 parts. This powder is dusted inside of wearing apparel, care being taken to avoid the forks of trousers, as the preparation, if used too freely, is an irritant. After the use of this powder the man should wrap himself up in a blanket to retain the fumes which are generated.

"Vermijelli" is less irritating than the above mixture and is composed of the following ingredients: Crude mineral oil, 9 parts; soft soap, 5 parts; water, 1 part. This preparation will kill adult lice but has no effect upon the eggs.

Clothing may be deloused by immersion in kerosene or gasoline.

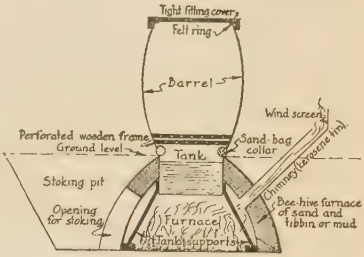


FIG. 301.—From "Sanitation in War," by Lelean

Ironing of clothes will kill both the adults and the eggs. Steam will accomplish the same purpose. The "Serbian barrel" and the "sack disinfector" are two simple devices for steam sterilization in the field. The Serbian barrel disinfector (fig. 301) consists of a portable barrel with a perforated bottom and a tightly fitting cover which is weighted down with stones. The barrel is placed over a tank of boiling water; the steam generated from the boiling water flows under pressure into the barrel. The water must be kept boiling at all times while this barrel is in use.

23–71. Bedbugs.—There are two species of bedbugs, namely, the Cimex lectularius and the Acanthia rotundata. The Cimex lectularius is the common bedbug found in the northern climates, while the Acanthia rotundata is found in tropical regions.

The eradication of these, especially in tropical regions, is a very difficult problem.

Fumigation with hydrocyanic-acid gas is effective in the extermination of bedbugs, but is too dangerous to be used by unskilled persons.

The blow torch is effective when applied to cracks of metal beds.

Kerosene, gasoline, turpentine, mercuric chloride solution, and other insecticides may be poured into crevices to exterminate this pest.

Beds may be immersed in a weak solution of caustic soda for a period of 15 minutes. After immersion they should be washed in clear water and allowed to dry in the sun. This method is said to kill both adults and eggs.

23–72. Cockroaches.—Sodium fluoride blown in corners and crevices is a standard poison for this pest. The roaches walk through this powder, some of which adheres to their legs, and they are poisoned when they clean themselves.

Another cockroach poison consists of dry plaster of Paris 1 part, flour 3 parts. When using this powder a dish of water should be close by. The insect after feeding becomes thirsty and drinks water, which sets the plaster of Paris.

Pyrethrum powders are extensively used as insecticide for cockroaches and other insects.

Section VII.—PERSONAL HYGIENE

23–73. The following are some of the principles of personal hygiene:

1. A daily cold bath followed by a brisk rub is beneficial to health.
2. The hands should be washed before each meal and immediately after using the toilet.
3. Teeth should be brushed at least once a day, especially at night.
4. Exposure to venereal disease should be avoided, but, if exposed, wash parts immediately with soap and water, then use prophylactic treatment.
5. Intemperance in eating and drinking should be avoided. Men who drink alcoholic liquor are more apt to get sick than those who abstain.
6. Daily exercise is conducive to health.
7. Periods of work should be followed by periods of relaxation, rest, or recreation.
8. Sufficient time should be allowed for meals; the food should be chewed thoroughly.
9. Bedding should be aired as often as practicable. Sunlight kills disease germs.
10. The hair should be kept short and the finger nails trimmed and clean.
11. Contact with the sick should be avoided unless duty requires it.
12. The tent should be "ditched" as soon as possible, even if the camp is only for one night. A little rain may spoil a whole night's rest.
13. Plenty of water should be drunk, but do not drink a large amount at any one time, especially when overheated.
14. Cold-drink stands and restaurants should be avoided unless they have been inspected and approved by the sanitary officer.
15. Underclothes, shirts, and socks should be clean. This is especially important before going into battle, as soiled clothes predispose to wound infection.
16. The mental attitude has a close relationship to health. Worrying and anxiety over trifles should be avoided—to accomplish this the mind should be kept occupied and interest maintained in work and recreation.

Section VIII.—CARE OF THE FEET

23–74. Care of the shoes.—Where the shoe is either too large or too small or has old, wrinkled, or broken drill lining, friction, pressure, and impact inevitably result. These three factors are paramount in causing callosities, corns, blisters, abrasions, tender, and sore feet. When searching for the cause of foot disability the fact that the shoe may be too large, too small, or too old, should, therefore, be borne in mind.

To make foot covering as waterproof as possible the sole and welt should be thoroughly oiled with neat's-foot oil, bacon rind (salt removed by soaking), or, in emergencies, with machine oil of good quality such as used in the lubrication of the rifle. The oil should be rubbed in well and the leather well kneaded. Care, however, must be practiced in oiling the uppers because too much oil clogs the pores of the leather, makes it impermeable, and prevents the moisture of the foot from evaporating.

Where the shoes have been water soaked do not place them too near the fire. Quick drying causes stiffness and hardness of the leather, which will produce corns, blisters, abrasions, and similar affections. Too rapid drying causes the leather to disintegrate quickly. Where haste is necessary, pebbles may be heated and repeatedly placed in the shoe and agitated until a sufficient degree of dryness has been obtained.

As a preventive measure, men should be urged to examine the shoe cavity for protruding nails, wrinkles, and other inequalities of the surface. Broad laces should be used, and, for the march, shoes should be laced sufficiently to hold the heel in place and prevent the foot shifting forward in the shoe. The tongue of the shoe should be smooth, free of wrinkles, and lie evenly under the laces.

23–75. Cleanliness of the feet.—The first essential in the proper care of the feet, as of the body, is attention to cleanliness. Where this is neglected an excessive amount of perspiration, fatty material, dirt, and skin scales accumulate. By the action of bacteria these decompose, causing offensive odor and disintegration of the skin. The individual then suffers from abrasions, blisters, tender, sweaty, and flaccid feet.

In the field, foot inspections are imperative. The feet should be inspected before and after every march. All minor injuries should be attended to promptly

to prevent them from becoming disabling affections which cripple the efficiency of a command.

Daily foot baths should be taken with cool or tepid water. Very little soap should be used. The feet should not be soaked too long as this softens the skin. If household ammonia is procurable, a few drops of that in the basin of water is advisable. Cold water hardens the skin, eases the sensation of burning after a march and increases the "tone" of the foot. By "tone" is meant that the muscles are held in a state of continuous contraction ready to respond quickly to the slightest call. After washing, the feet should be thoroughly dried.

The feet should be washed and the socks changed after every hike. By scraping a hole in the ground over which a poncho is spread a suitable basin is made into which water may be poured. Where water is scarce, a few spoonfuls may be poured on a towel, handkerchief, or paper and applied between the toes.

Toe nails should be kept trimmed by cutting straight across. Nails deformed by overgrowth, such as unusually thick and clubbed nails, can be remedied by soaking in hot water and paring down with a knife.

23–76. Blisters and abrasions.—All blisters and abrasions should receive early treatment—first evacuating the fluid by puncture with a needle. The blister (outer or false skin) should not be torn or removed. The skin should be dried with gauze or absorbent cotton and the blister covered with adhesive plaster firmly pressed down so that the raised outer skin will be forced into position. The adhesive plaster may be made to stick well by heating it with a match. Should it be impossible to procure adhesive plaster, then vaseline, boric acid, or zinc oxide ointment may be applied. Search should be made for all areas which are red and tender. Adhesive plaster should be placed over these.

Heel blisters should be given particular attention.

A satisfactory foot powder may be made, as follows:

	Parts
Salicylic acid	3
Powdered starch	10
Talcum powder	87

It is important that socks fit properly. Small ones will pinch the feet and readily become torn, forming creases; too large socks soon fold and crease beneath the feet, bruising and blistering the skin. Torn socks must not be worn while on the march. Repaired socks are also harmful. It is well to stretch the socks at the end of a day's march. If washing is impossible, change and put the socks on the opposite feet to the ones on which they were worn the day before.

C. First Aid and Military Hygiene

Section I.—GENERAL

23–77. Knowledge of first aid.—It is the duty of every officer and man to familiarize himself with the details of first aid, so that he may be able to give efficient help to wounded comrades, and, in case of necessity, direct or assist in efforts made in his own behalf. By first aid is meant the measures that should be employed in the immediate treatment of gunshot wounds and various accidents and emergencies.

23–78. Efficiency in first aid can be attained only by thorough drilling. In order to save life, some one on the spot must be able to render assistance to the apparently drowned or suffocated, and to those suffering from severe hemorrhage (bleeding).

23–79. Wound infection.—One of the important duties of those behind and on the firing line, is to prevent wound infection. This is accomplished by having division officers and the men well trained in first-aid methods and how to apply first-aid dressings, so that they can intelligently treat not only their own wounds but those of their comrades. The measures for preventing wound infection are extremely simple and are effective in saving life, preventing suffering, and in hastening recovery.

23–80. Handling the wounded.—Officers and men should be instructed in the proper methods of handling the wounded and in improvising splints and litters.

Section II.—LIFE-SAVING METHODS

(Illustrations and text by courtesy of the American Red Cross)

23–81. Disrobing.—A life-saver is advised to remove shoes and any heavy clothing before plunging in to make a rescue. If clothing must be removed in the water, take a deep breath and allow yourself to be submerged while unlacing your shoes. Work at the lacing with both hands. Avoid hurried movements, as in the water they will soon exhaust your strength.

After removing the shoes, remove trousers, then jumper or coat. These latter often fill with air and help keep you afloat.

When clothing has been removed swim to the rescue, resting on your back if necessary.

Approaches

23–82. In approaching drowning persons, swimmers should get their attention and reassure them by calling in a loud voice that assistance is at hand.

It is safest to approach a drowning person from the rear. Swim to a point directly behind him, reach one hand under his chin and pull his head back. At the same time, place the other hand under his back at the base of spine to raise him into a horizontal or floating position. Still holding his chin in one hand start swimming with free hand and scissors kick until body is moving along smoothly, the theory being that a moving body always floats better; then change to carrying position. By this method the rescurer will find that the carry is greatly facilitated.

FIG. 302

When it is impossible to approach from the rear, either the underwater or the surface approach can be used. The underwater approach is undesirable where the water is very muddy and it might be difficult to locate the subject under the water.

To make the underwater approach, swim to a point about six feet in front of subject, dive under and grasp his knees, turning him about. During the dive, and in reaching for subject's knees, keep your arms straight before you to avoid getting close enough to him to have him grasp you with his legs. After turning subject about, come up behind him and proceed as in rear approach.

FIG. 303

FIG. 304

To make surface approach, swim toward subject, facing him, reach in with your right hand and grasp his right wrist, or with your left hand grasp his left wrist. While treading water, lean backward, pulling subject toward yourself, quickly spinning him around until his back is turned to you, and then proceed as in rear approach.

Carries

23–83. Once the proper approach has been made, the subject should be turned into one of the five methods of carrying and his face kept out of water while he is being carried.

1. *Head carry.*—Cover subject's ears with palms of your hands, so that your middle finger rests along his jawbone on each side. Holding his chin to arch subject's back, swim, using frog kick or vertical or reverse scissors kick. In the

latter, the hips are tipped slightly to one side and legs separated as in side stroke, but with upper leg opening backward and under leg forward, reversing the ordinary scissors kick to avoid fouling the subject.

2. *Cross-chest carry.*—From position back of subject, reach across his shoulder and chest, placing your hand under his farther armpit. (Shoulder blade is more comfortable if you can reach it.) Hold subject so that your hip is directly under center of his back, and his shoulder tight under your armpit. Swim on your side, using scissors kick and side-arm pull.

FIG. 305.—Head carry

FIG. 306.—Across chest carry

This carry is a favorite among life-savers because subject is completely under control.

3. *Hair carry.*—From position back of subject, place your hand at crown of his head, your fingers toward his forehead, grasping a handful of hair. With your hand in this position he will not roll over. Swim on your side with side-arm pull and scissors kick. Keep your holding arm straight.

FIG. 307.—Hair carry

FIG. 308.—Arm lock carry

This carry is especially easy to learn and is optional with the arm-lock carry.

4. *Arm-lock carry.*—From position back of subject, reach under subject's near arm, and grasp his farther arm at the biceps, or at the wrist if subject is too large. This puts elbow low to raise hips.

Your arm being under subject's back, he is raised high in the water as you swim with scissors kick and side-arm pull.

Keep subject close to you, his near arm pressed tight against you.

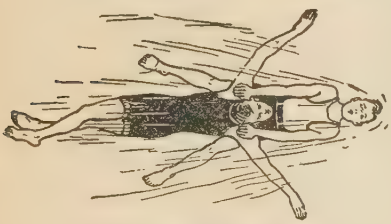


FIG. 309.—Tired swimmer carry

5. *Tired-swimmer's carry.*—This carry is intended only for assisting a person who has become tired. It should never be used on a struggling person. Simply swim to the subject, telling him to lie on his back and place his hands on your shoulders, with his arms straight and feet spread apart.

Swim breast stroke, using either frog or scissors kick. Watch subject's face.

Release Methods

23–84. If drowning person is struggling violently, so that it is impossible to subdue him or grasp him with safety, it is well to simply wait for him to exhaust himself before attempting to carry him to safety. Never attempt to strike the subject to render him unconscious. Such a feat is almost impossible in the water. Breaking holds by inflicting pain is impractical, also. It may work in practice, but a desperate man fighting for his life will not be affected by such methods.

Practice the proper approaches and use them in emergencies, to avoid being caught in the hold of a drowning person. The following release methods are effective, and it is advisable to be familiar with them, but the use of the proper approaches will lessen the danger of your being placed in such a position that the release methods will be required.

Each of these methods is followed by the proper turn, getting subject in horizontal position, and starting the carry. In breaking holds let yourself be submerged with subject, performing the break under water. This is done because a drowning person releases a hold more readily under water, his constant desire being to climb to the surface to obtain air. Utilize this tendency to escape.

23–85. Front strangle hold.—You are grasped tightly around the neck from the front, subject's head over your shoulder.

FIG. 310.—Breaking front strangle hold

If subject's head is over your right shoulder, put your right hand on his right cheek, little finger against side of nose with thumb hooked under angle of lower jaw, and push his head toward your right and at the same time put your left hand on subject's encircling arm above the elbow and lift, following through—pushing toward the right. Then duck under this arm as you raise it, and continue pushing with both hands until subject is turned with back to you. Proceed as in rear approach.

If subject's head is over your left shoulder, use your left hand on his left cheek, and your right hand to lift his left arm.

23–86. Back strangle hold.—You are grasped tightly around the neck from the back. Grasp subject's lower hand and *twist* it down and in toward his body. With your other hand, grasp his lower arm at the elbow and *push up*.

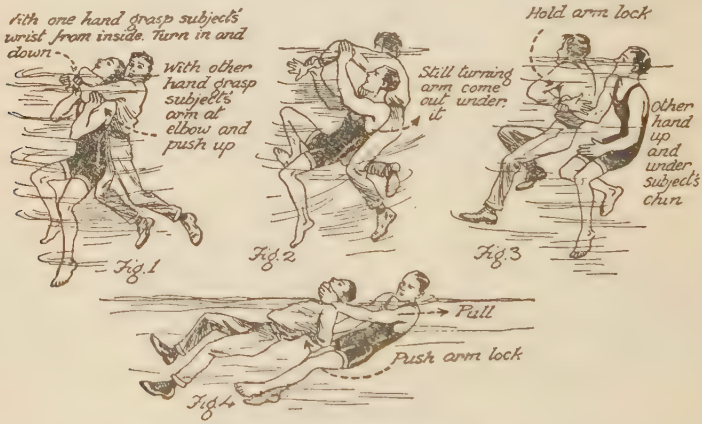


FIG. 311.—Breaking back strangle hold

Turn your head in the direction you are to turn him, duck *under* this arm as you raise it, and continue twisting his hand until he is turned back to you, and his arm is in hammer lock position, to raise hips. Use other hand for chin pull to get his body flat on surface and swim with hand that held wrist. Shift to cross chest carry.

If subject's left arm is the lower, use your left hand to raise his elbow and your right hand to twist his hand.

If subject's right arm is the lower, reverse the process.

23–87. Double grip on one wrist.—Subject grasps your right wrist with both hands. Put your left hand, which is free, on the subject's left with thumb on top and fingers under, ready to pull as soon as your foot is in position. The foot is used to push on the opposite shoulder as the arm is pulled toward you.

Use left foot against subject's right arm pit, bringing it over subject's arms. Be careful about kicking subject in the chest or breast. Caution all candidates to push in the hollow of the shoulder and not below it in practice. Straightening the leg as you pull with the left hand gives the necessary force to break the hold. The right wrist naturally turns against the thumb which is holding it.

If you find that you are unable to reach subject's shoulder with your foot, due to your shorter reach, bend your elbow until your foot is in contact.

When the hold is broken, turn into position for rear approach and push body up into a carrying position. Should the left wrist be grasped, reverse the procedure, pulling with your right hand and pushing on the left shoulder with the right heel.

FIG. 312.—Breaking two people apart

23–88. Breaking two people apart.—Two people are clinging together in a front strangle hold. Swim to a point directly behind one of them, and place your hands on throat (Adam's apple); raise one foot over locked arms of subjects, placing heel under chin of subject facing you against his neck, also pressing Adam's apple; straighten your leg, *push* hard, and pull, separating the two. (Avoid kicking.)

Carry subject you are holding to safety.

23–89. Carry from shallow water to shore.—For the fireman's lift, tow subject from deep water to water waist deep. Place subject on his back in a floating position. Standing at his right side, at the waist, place your left hand under his head at the neck. Reach your right arm between his knees from above, grasping his left knee. Duck by bending knees and roll subject face downward over your head as you go under water. Stand up and the patient will be evenly balanced on your shoulders and held in place by your right arm, which is now around his right knee, your right hand clasping his right wrist, leaving your other hand free.

FIG. 313.—Carry from shallow water

Many people prefer the saddle back carry.

For the saddle back carry, bring the subject to a floating position in waist-deep water. Standing at his right side facing the head, reach your right arm across the waist from above, lifting his left arm out of the way until it rests upon your shoulders. Continue to reach with right arm until hand is lifting subject's head out of water. Use your left arm to catch both of subject's legs behind knees as you turn, bending him across your hips. The weight should be above your belt line to insure easy balancing.

To lower patient from saddle back position, rescuer kneels on both knees and leans backward until patient rests upon the ground behind heels.

Lifting from Water

23–90. To lift a subject from deep water to the edge of a tank, onto a float, or over the stern of a boat, proceed as follows: Hook subject's fingers over the edge, placing one hand on top of the other, resting one of your hands on subject's hands to hold them in place, then climb upon float or side wall and grasp right wrist of subject with your right hand and his left with your left. With subject facing you and with your wrists crossed, raise and lower him several times to gain momentum, and with a final lift pull him out of the water, uncrossing your hands as you land him in a sitting position facing the water. He can then be pulled into a reclining position without difficulty.

Section III.—RESUSCITATION

23–91. Anything which interferes with the supply of good air to the lungs and prevents the escape of the used air will cause suffocation, such as the presence of a poisonous gas or smoke, an electric or a lightning shock, drowning, and hanging. Usually when found, the person is unconscious, lips, nails, and skin are blue and respiration has ceased. If seen earlier, there is an occasional gasping breath.

23–92. When a person is shocked by electric current, first shut off the current if it can be done quickly. Otherwise set about removing subject from contact

with wire or rail. During the process of removal the rescuer must not come in contact with the body of the person shocked. Use rubber gloves, rubber coat, silk, *dry* board, *dry* cloth.

23–93. In gas poisoning from automobile exhaust gas, illuminating gases, and gas from burning charcoal, the carbon monoxide combines with the blood, actually diminishing the amount of oxygen the blood can absorb.

23–94. How to give artificial respiration by the prone pressure method.—The prone pressure method of artificial respiration described in these rules should be used in cases of suspended respiration from all causes—drowning, electric shock, carbon monoxide poisoning, injuries, etc. Follow the instructions even if the patient appears dead. Continue artificial respiration until natural breathing is restored or until a physician advises you to discontinue your efforts.

FIG. 314.—Prone pressure artificial respiration. Applying pressure

1. Lay the patient on his stomach, one arm fully extended over head, the other arm bent at elbow and with the face turned outward and resting on hand or forearm. (This protects the mouth and nose from dirt, provides a slant to head for drainage, and allows tongue to drop forward.) (Fig. 314.)

2. Kneel straddling the patient's thigh, or thighs, with your knees placed at such distance from the hip bones as will allow you to assume the position shown in Figure 314.

Place palms of the hands over lower ribs, one on each side of the spine, about four inches apart, at right angles to spine, with the thumb and fingers in a natural position. The hands are in correct position when the little finger of each hand is over and following the line of the lowest rib. (Fig. 314.)

FIG. 315.—Prone pressure artificial respiration. Releasing pressure

3. Move weight of body slowly downward and forward for three seconds (count 1–2–3 slowly); do not let hands slip. Keep arms straight. The shoulder should be behind the hands, so that the pressure exerted is forward as well as downward, and by the "heels" of the hands, and not the fingers. (Fig. 314.)

4. Release pressure suddenly, removing hands from the chest, allowing chest to expand and fill with air. (Fig. 315.) After two seconds' interval (count 1–2 slowly) repeat pressure. This makes 1 respiration every 5 seconds, 12 per minute. *Do not work faster than this.* After rhythm is obtained actual counting can be stopped.

During the interval operator can swing back and sit on his heels, thus relaxing muscles of his back. This will enable him to work for a much longer period.

5. Do not give up! There are cases on record of resuscitation after thirty minutes' submersion. There is no certain sign by which you can determine that it is too late for artificial respiration. If no results are seen the patient should not be abandoned until at least 3½ hours of effort have been made to revive him.

23–95. Supplemental Treatment.—While carrying on artificial respiration organize helpers, but *do not stop artificial respiration for anything.* Send for a physician, blankets, hot water bottles or heated bricks, hot water or tea or coffee for stimulants (no alcoholics). Have patient's clothing loosened around neck and chest; mouth and nose cleared of any mucous or mud, and tongue moved back and forth occasionally to stimulate reflexes; body and limbs rubbed toward the heart. Have blankets and hot water bottles applied, but not any hot articles next to the patient's skin. If there is aromatic spirit of ammonia at hand have some poured on handkerchief and placed near patient's nose. Have the crowd that may have collected kept well back so as to give the patient plenty of air. Select an intelligent helper to watch you and so instruct him that he may be able to take your place when you need a relief.

When patient begins to breathe, and can swallow, give him sips of aromatic spirit of ammonia (teaspoonful to ¼ glass of water), or hot water, coffee, or tea. Do not allow patient to walk or otherwise exert himself; he should be carried to some place where he can be put in bed and receive medical attention.

23–96. Caution.—Often inexperienced or excited persons attempt to administer artificial respiration when there is no need for such treatment. It is not required when the patient, on removal from the water, is able to breathe. Such cases are in need of treatment for exposure and shock. They should be placed on a slanting surface, head down; covered by blankets and hot water bottles; stimulated by hot drinks or aromatic spirit of ammonia (teaspoonful to ¼ glass of water); massage of limbs; carried to a bed for further medical attention.

23–97. Summary.—Save the seconds and you have a better chance of saving the life. Do not waste time carrying patient to a quiet spot. Work where he is taken from the water. Do not waste time trying to get water out of the stomach. *Turn patient's face down and go to work immediately.*

Section IV.—REMOVAL OF FOREIGN BODIES

23–98. Foreign bodies in the eye usually lodge on the inner surface of the upper lid. If on the eye ball or on the lower lid they may be removed with the end of a tooth pick or match wrapped with cotton, or a clean bit of cloth, or with the corner of a clean handkerchief. If on the inner surface of the upper lid, the lid should be turned back in order to detect the foreign body. To do this, tell the patient to look down, press a match, pencil, or the edge of a finger, across the upper lid, half an inch above its edge, at the same time taking hold of the lashes and turning the lid up. Remove the foreign body with the angle of a card or a twist of cotton on the end of a toothpick. Figures 316 and 317. If avaiable, a few drops of boric acid solution will relieve irritation.

FIG. 316.—Upper eyelid turned back

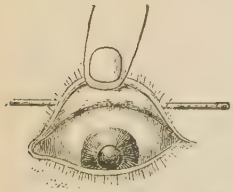


FIG. 317.—Method of turning up the upper lid

If the foreign body is embedded in the eye, a doctor's services should be obtained as promptly as practicable.

If the foreign body can not be removed or when there is other injury to the eye, it should be covered with a dressing soaked in cold boric acid solution or cold water to prevent further injury which might result from rubbing or movement of the lids.

Lime or lye should be washed out with boric acid solution or clean water and then the eye should be washed with a solution of vinegar, one teaspoon to a cup of warm water followed by castor or sweet oil.

Acid in the eye should be washed out with boric acid solution, clean water or with lime water followed by castor or sweet oil.

23–99. Foreign bodies in the ear, including insects, are best removed by gentle syringing with warm water (if a syringe is available) or by pouring water into the ear. Toothpicks, matches, etc., should not be used as serious injury to the ear may result. If the foreign body is not easily removed summon a doctor. Water should not be used to remove object which might swell in the ear.

23–100. Bites and stings of insects.—(1) Extract the sting if possible; squeeze the part lightly, which will expel some of the poison. Pressure made with the barrel of a hollow key is excellent for this purpose. Then apply ammonia water, wet salt, or cold applications.

(2) The stings and bites of poisonous spiders, tarantulas, scorpions, and centipedes often make their victims very ill, but rarely are any of them fatal in their effects. Circulation should be cut off with a string or tourniquet as in treating snake bite and the wound strongly sucked until the part is free of poison; then apply ammonia water and cold wet applications.

23–101. Ivy or sumac poisoning.—This form of poisoning is quite common. It is a local irritation and inflammation of the skin caused by contact with the leaves of the poisonous plant. Within a few hours there is a reddening and itching of the skin, which becomes inflamed and swollen, blisters and even pustules often developing.

Treatment.—First scrub the part coming into contact with the ivy or sumac with soap and water to remove the poison. If available, a 4 per cent solution of ferric chloride in equal parts of glycerine and water is an excellent wash and should be applied to all exposed surfaces. A solution of ferrous sulphate in water is just as effective. This treatment is a preventive measure if used before going in woods where poison ivy or oak grows.

After the skin inflammation has developed the parts should be washed each day with lime water or boric acid solution, and then zinc oxide ointment, carbolized vaseline, or a solution of Epsom salts applied.

23–102. Snake bites.—The poisonous snakes of North America, except the coral snake, belong to the pit-viper family, which includes rattlesnakes, copperheads, and water moccasins. These snakes have a pit or depression between the eyes and nostril, which readily identifies them. Their heads are heart shaped, bodies thick, and their teeth are arranged in two rows. Outside of the teeth in the front part of the upper jaw are two fangs, one on each side. Fangs are characteristic of poisonous snakes everywhere. If the bite shows wounds from two rows of teeth and two fangs, it is that of a poisonous snake (see fig. 318). A single puncture usually means a fang prick. The teeth in the nonpoisonous snakes are arranged in four rows and the bite shows four punctures. (See fig. 319.)

FIG. 318.—Imprint of poisonous snake

FIG. 319.—Imprint of nonpoisonous snake

The bite of a poisonous snake causes great pain attended by rapid swelling, much depression and weakness, and followed quickly by death in some cases unless treatment is promptly given.

23–103. Treatment.—In every case of snake bite proceed as follows unless the snake is known to be of a harmless type. If the bite is on one of the extremities, the limb should be immediately encircled between the wound and the heart with a tourniquet; anything will do which will prevent the posion from reaching the body; a string, handkerchief or bandage, a belt or a piece of cloth torn from the clothing. If a knife is available make several crisscross cuts through the bite and then suck the wound thoroughly, spitting out the blood and poison from time to time. Men going into country where snakes are liable to be encountered should carry a bottle of crystals of potassium permanganate. These should be rubbed into the wound made by cutting into fang holes and will oxidize the poison. A solution of potassium permanganate injected with a hypodermic syringe around the bite may prevent the poison from being absorbed by the system. Even though potassium permanganate is used the rest of the treatment should be carried out. After about a half hour the tourniquet should be slightly loosened so that the circulation in the limb may be reestablished. This will let some of the poison into the circulation and the tourniquet should be tightened again at once. Watch the patient for serious depression and weakness. This operation may be repeated in a few moments if there are no ill effects. Give aromatic spirit of ammonia, beef extract, coffee, or tea to stimulate patient.

Section V.—BURNS AND SCALDS, SUNSTROKE, HEAT EXHAUSTION, FROSTBITE, AND FREEZING

23–104. Burns.—(1) A burn is the local effect of dry heat, such as flame, hot metal, electric current, etc.

(2) Scalds are due to moist heat, such as hot water or steam.

(3) There are three degrees of burns—first degree, a mere reddening of the skin; second degree, the formation of blisters (these two degrees of burns are not followed by scarring, and unless one-sixth of the body surface is involved recovery may be looked for); third degree, charring and destruction of the tissues; both layers of the skin are burned and scarring always follows. These injuries are common in the naval service and are often of extreme gravity.

Considerable shock may accompany burns, the severity of the shock depending on the extent of the body surface involved. Shock is evidenced by a cool moist skin, shallow respiration, and weak pulse.

Treatment.—Remove the clothing from the part with the utmost care to avoid breaking blisters. It may be necessary to cut the clothing away, and if the clothing sticks to the burned surface it should be soaked with oil or warm salt solution before removing it. Only one part should be dressed at a time. In first and second degree burns, cover the burned surface with cloths or pieces of lint soaked in a saturated solution of boric acid, baking soda, Epsom salts or a one per cent solution of picric acid. If obtainable a dressing of boric acid ointment, olive oil, fresh lard or cream, will also give relief. Carron oil, which is made by shaking equal parts of raw linseed oil and lime water together, is a simple and popular dressing for burns. Strong antiseptics and powders should be avoided.

23–105. Extinguishing burning clothing.—If your own clothing catches afire, do not run, as this but fans the flames. Lie down on the deck, etc., and roll up tightly in a coat, blanket, or anything at hand that will smother the flames, leaving only the head out. If there is nothing at hand with which to wrap up, lie down and roll over slowly, beating out the fire with the hands at the same time.

If another person's clothing catches afire, throw him to the ground and smother the fire with a coat, blanket, etc. In doing this, stand at the head and holding down with one foot the blanket or whatever is used throw it towards the feet of the person, thus sweeping the flames away from yourself and the face of the burning person. It is well to bear in mind that the air close to the deck is comparatively free from smoke. Hence when unable to breathe, a rescuer should crawl along the floor with head low, dragging anyone who has been rescued behind him. A wet handkerchief or cloth tied over the mouth and nostrils minimizes the danger of suffocation.

23–106. Burns by acids.—Flush the parts with water; then apply baking or washing soda and water, lime water or soapsuds. This neutralizes any acid remaining and after this the burn may be treated as other burns. Burns from *carbolic acid* (phenol) should be washed with *alcohol*, if obtainable.

23–107. Burns by alkalies.—The parts should first be washed with water, then neutralized with diluted vinegar or lemon juice, and finally treated as for an ordinary burn.

23–108. Sunburn.—Sunburn should be treated in the same manner as other mild burns. Lime water, with the addition of two drops of liquid carbolic acid to the ounce, is a very soothing application.

23–109. Sunstroke or heatstroke.—This is a dangerous condition due to the sun's rays or to prolonged exposure to excessive heat. Usually before the actual attack there is a feeling of oppression, headache, dizziness, and redness of eyeballs. If the symptoms are not checked the patient becomes unconscious, face flushed, pupils dilated, and the skin hot and dry with engorged blood vessels. The pulse is rapid and the breathing labored. Spasms and often convulsions follow. If one feels the heat to be excessive and experiences the symptoms described above, a stroke may be avoided by stopping work, seeking a cool spot, bathing the face and head in cold water, and drinking a cup of hot water or tea to induce sweating.

23–110. Treatment.—Lowering the temperature is the primary object in these cases. Carry the person to a cool, airy, shaded spot, and remove as much clothing as practicable. Pour cold water or ice water over the head and body, or ice may be rubbed over the chest and placed in the arm pits. If at hand, a cold bath should be given, and while in the bath rub to restore circulation. When consciousness returns the cold applications should be discontinued and cool

drinks or hot tea may be given. Do not give stimulants. These cases are serious in character and should be treated promptly and actively. If there is no ice at hand, cool water and fanning must be employed.

23–111. Heat exhaustion.—This is a condition of great depression of the system due to exposure to excessive heat. It often begins with dizziness, nausea, and vomiting. The skin is cool and moist, the pulse feeble and fluttering, perhaps imperceptible, and the patient greatly depressed, though he may not be unconscious.

23–112. Treatment.—Carry to a cool place and loosen clothing. Give stimulants such as hot coffee, tea, or soup, or aromatic spirit of ammonia. Do not use cold sponging or bathing.

Effects of cold

23–113. Frostbite.—This is due to the local effect of cold on the exposed parts of the body. Usually the toes, fingers, ears, or nose are involved. The affected part has been extremely cold, then it becomes insensitive and has a white or grayish color.

23–114. Treatment.—The object in treating frostbite is to restore slowly and gradually the cirulation of the blood and warmth in the part affected. If the case is mild and some reaction from the extreme cold has begun, rub the part lightly and apply cloths wrung out in cool or tepid water. If the part is still dead and cold, combine the rubbing with the use of wet snow or ice water and as circulation begins to return use water not so cold. The rubbing must not be too energetic, as any roughness or bruising will increase the damage. Also do not use heat at first as the danger of sudden thawing is gangrene or death of the part. Hence while the person should not go into a warm room or near a fire, he should go or be removed to a sheltered place until circulation is restored. After the circulation is well established, then warm water may be used for bathing the affected part.

23–115. Freezing.—This condition of the body is produced by long exposure to extreme cold. The effect of the cold is increased by overexertion, hunger, insufficient clothing, and alcoholic liquors. The body and limbs first feel numb and heavy, and then become stiff, followed by drowsiness and an irresistible desire to sleep. The depression of vitality is so great that the appearance is frequently that of a dead man.

23–116. Treatment.—The object is to restore warmth to the body gradually. Carry the person into a cold room, rub his limbs toward the body briskly with rough cloths wet in cold water. When stiffness is removed, artificial respiration should be performed if necessary. Gradually increase the temperature of the room and of the cloths used. As soon as he can swallow give stimulants in small quantities such as hot tea, coffee, or soup, or aromatic spirit of ammon a. A frozen person must not be taken into a warm room at once because sudden irestoration of circulation frequently causes violent congestion and often sudden death through the formation of clots in the blood vessels.

Section VI.—UNCONSCIOUSNESS, EPILEPTIC FITS, AND POISONING

23–117. Unconsciousness may result from a number of different conditions and to treat it properly you should first endeavor to determine the cause. The surroundings should be considered as well as the appearance and condition of the unconscious person.

The common cause of unconsciousness are: Bleeding, severe injuries,electric shock, gas poisoning, sunstroke or heatstroke, heat exhaustion, freezing, fainting, fits, apoplexy or brain injuries, and certain poisons.

23–118. Treatment.—Take immediate steps to remove the apparent cause of insensibility, viz: Stop bleeding; remove from presence of the poisonous gas; carry to shady place in case of sunstroke; or act as may be otherwise indicated. In case the body of the unconscious person is in contact with a live wire, the first thing to be done is to set him free from the wire. Great caution should be exercised in doing this, as to touch him with the bare hands will give the rescuer the same shock. If possible, the current should be cut off immediately. If this can not be done, contact may be broken with a piece of dry wood or if two live wires are in contact with the person they may be short circuited by dropping an iron bar or a metallic tool across them. The rescuer's hands should be protected with rubber gloves; if these can not be procured, first wrap a mackintosh coat, or a thick dry, woolen-cloth coat, or other dry articles of clothing around the person, and then pull him away from the source of danger.

To treat unconsciousness, place the person on the back with the head lowered. Loosen clothing. Hold ammonia or aromatic ammonia on a cloth under the nose. Do not try to give anything by mouth to an unconscious person. Sprinkle face and chest with cold water and rub the limbs toward the body. Keep the crowd away so that the person can get plenty of fresh air. When able to swallow give stimulants, coffee, tea, soup, or aromatic ammonia. Use artificial respiration if necessary. Proceed as directed in resuscitation.

23–119. Epileptic fits.—The person, usually a young adult, falls with a cry, the face is livid and person foams at the mouth. The foam is often blood tinged as the tongue is usually bitten. There are usually convulsive movements, rolling the eyes, throwing the arms and legs about.

23–120. Treatment.—Lay the person on his back and control movements which might cause injury. Place a folded towel or other convenient wedge between the teeth so that the tongue will not be bitten. The convulsion usually lasts only a few minutes and then the person falls into a deep sleep which should not be interrupted. In the unconscious stage evidence of an epileptic seizure may be detected by the disarranged clothing, foam at the mouth, or the bitten tongue.

23–121. Poisoning.—Certain circumstances indicate that a poison has been taken.

(1) In a person who has been in good health, sudden and severe sickness after eating, drinking, or taking medicine.

(2) Possibly the person affected may have been sick, despondent, or has talked of suicide.

(3) The presence of bottles or glasses in which some of the poison remains.

(4) Frequently the person who has taken poison becomes frightened and tells some one.

(5) If a number of persons who have eaten the same food become seriously ill after a meal, it is almost certain that they are suffering from poison, or probably food infection, called "ptomaine poisoning."

(6) In carbolic acid poisoning there is a strong carbolic odor and the lips, tongue and mouth are burned white.

(7) In morphine poisoning the pupils are pin-point in size, breathing is full and slow and the person is very drowsy and, later, sleeps so soundly that it is almost impossible to arouse him.

(8) Alcoholic poisoning may be evidenced by a strong odor of alcohol, pupils dilated, face usually flushed. Eyeballs red but not insensitive to touch. If unconscious, the condition should be differentiated from apoplexy. An apoplectic may have been drinking and so have the odor of alcohol on this breath. His pupils are frequently unequal in size and there is a paralysis usually on one side of the body which may be shown by raising an arm or a leg. If paralyzed it will drop and offer no resistance.

23–122. Treatment.—Cases of accidental or suicidal poisoning may often be saved if treated promptly. If the poisoning agent is not known the safest procedure is to give at once by mouth large quantities of lukewarm water. Then a mild emetic should be administered. A tablespoonful of powdered mustard or two tablespoonfuls of common table-salt in a glass of warm water are both excellent emetics, and may be repeated once or twice. Soap suds or dishwater may act as an emetic, and in urgent cases should be tried. After copious vomiting, soothing liquids should be given, such as oil, milk, beaten up raw eggs, or flour and water, each in moderate quantities. Then strong coffee, tea, or aromatic spirit of ammonia should be administered and the person should be kept warm with hot bottles. Rub the limbs toward the body to increase the circulation. Obtain the services of a doctor as soon as possible.

23–123. Acid poisoning.—In acid poisoning give alkalies, such as a tablespoonful of aromatic spirit of ammonia in a glass of water, baking soda, whitewash, tooth paste, or soap.

23–124. Alkali poisoning.—In alkali poisoning, vinegar can generally be obtained and is an excellent antidote. It should be given undiluted and freely—a half teacupful at a time. Lemon juice may also be used.

Section VII.—SPRAINS, DISLOCATIONS AND FRACTURES

23–125. Sprains.—A sprain is the straining or tearing, by a sudden twist or wrench, of the ligaments and capsule which surround a joint. The twisting and stretching of the ligaments result in the rupture of blood vessels with the escape of blood and blood serum (the liquid part of the blood) both around and into the joint.

23–126. Signs.—Pain, heat, and swelling at the seat of the injury, followed by discoloration of the skin. The ankle, wrist, knee and elbow are most commonly sprained.

23–127. Treatment.—Absolute rest of the part. Elevate it if possible and apply cold or heat. Cloths soaked in ice water are excellent and a pack of crushed ice is also good. Cloths soaked in hot water are very good and should be changed frequently so that the application may be kept hot. Hot or cold applications should be continued at intervals for 24 to 48 hours after which a snug bandage should be applied. If necessary, a splint should be utilized to prevent the patient from using the joint. A sprained joint should be rested for a few days at least, often longer, depending on the joint involved and the severity of the injury.

23–128. Dislocations.—A dislocation is an injury to a joint, characterized by a displacement of the head of the bone (a slipping out of its socket).

23–129. Signs.—First there is deformity; the joint has an unusual appearance. This is best seen by comparing the injured side with the well side. There is limited movement, pain, some shock, and usually swelling.

23–130. Treatment.—Send for a doctor at once. The risk of doing injury by injudicious efforts to replace a dislocated bone is greater than that of delaying until the services of a medical officer can be obtained. Place the injured member in the position most comfortable for the person and cover the part with cold wet cloths while waiting for the doctor.

23–131. Special dislocations.—Dislocations of the lower jaw and of fingers may be treated by anyone who has only a slight knowledge of first-aid.

A dislocated jaw, with the mouth very wide open in consequence, is most painful and uncomfortable. The person is unable to close the mouth. To reduce this dislocation, wrap both your thumbs with several layers of cloth so that they will not be bitten. Then place both thumbs in the person's mouth on the lower teeth, one on each side, while the fingers grasp the outside of the lower jaw. Pressure is then made downward and backward. As the jaw starts to slide into place, let the thumbs slip off the teeth to the inside of the cheeks. If this is not done they will be caught by the teeth as the jaw bone goes into place. After reduction, apply a jaw bandage.

Dislocation of the fingers.—These dislocations are easily reduced. Grasp the finger on the palm side and hold firmly while with the other hand pull the end of the finger straight out. The bone will ordinarily slip easily into place. No dressing is required.

Section VIII.—WOUNDS IN GENERAL

23–132. A wound is any injury in which the skin is pierced or broken. The skin ordinarily acts as a protective covering for the body and prevents the entrance of pus germs, but a break in the skin may allow germs to enter the system which can cause inflammation, formation of pus (matter), or blood poisoning. These germs can only be seen with a powerful microscope but we know that they are found practically everywhere; on the surface of our body (especially on the hands), and on anything which may cause a wound. Consequently in any wound, except those made by a surgeon, whose training has made it possible for him to prevent infection, there are a certain number of germs introduced. Many of them are washed out by the bleeding which occurs, and the tissues of the body generally destroy the remaining ones. We find such wounds heal rapidly with very little, if any pus formation. In wounds made with sharp instruments there are fewer germs introduced than in those made by blunt instruments. There is also less damage to the tissues and the uninjured cells of the body are better able to destroy germs than the bruised tissues which result from wounding with blunt instruments.

23–133. Treatment.—It is always best to have a doctor see the wound, if he is available. Turn back or cut away clothing from the wound. All clothing may be a source of infection. If there is severe bleeding check it before applying the first-aid dressing.

Minor wounds or wounds resulting from crushing injuries may be treated as follows:

(1) Do not touch the wound with the hands or allow the person to do so.

(2) Swab the wound freely with iodine or turpentine using a small brush or a piece of cotton on a stick.

(3) Apply first-aid dressing over the wound.

(4) If there is much delay before reaching a doctor the parts around the injury may be carefully cleansed provided the first-aid dressing over the wound is in no wise disturbed.

When confronted with major wounds, the following instructions should be followed: 1. *Do not touch the wound with the hands* or allow the person to do so. 2. *Do not wash it* as water contains germs and may infect the wound. 3. *Do not use* antiseptics such as bichloride of mercury and carbolic acid, for if used too strong the cells of the tissues may be destroyed, and their assistance is lost in fighting the infection. 4. The best way to prevent infection is to cover the wound with a sterile dressing, such as is contained in a first-aid packet. This should be bound on at once and will help to check slight bleeding.

It is better to leave the wound exposed to the air than to apply a dressing which is not sterile, as a wound is not apt to become infected from air.

(5) Iodine solutions are very valuable in the treatment of wounds, as they will kill many of the germs. Paint the wound freely with a small brush or a piece of cotton on a stick.

(6) *Do not use iodine near the eyes.*

(7) For directions in use of first-aid packet, see The Application of First Aid Dressings.

23–134. A fracture is a broken bone.

Causes.—*Direct violence* in which the bone is broken where struck. *Indirect violence*, in which the bone is broken at some distance from the point which received the blow such as a broken collar bone following a fall upon the outstretched hand. *Muscular action*, breaking a bone by a sudden and violent muscular contraction, as in the case of the kneecap in jumping.

Signs of Fracture.—These are pain, swelling, and deformity at the seat of injury. Unnatural mobility, loss of power, and usually shortening of the limb, "crepitus", which is a sensation of grating to be felt when the broken ends of the bones move against each other.

Varieties.—There are two general classes of fractures, simple and compound.

(1) *Simple fractures* are those which are beneath the unbroken skin.

(2) *Compound fractures* are those in which an external wound, communicating with the break, exists.

23–135. Treatment. In the immediate treatment the following points should be attended to: The prevention of further injury, and the preparation of the person for transport. To prevent further injury attend to the person on the spot where the injury occurred, especially if the fracture happens to be in the lower extremity. Do not unnecessarily handle the limb until you have all splints and bandages ready. By rough handling a simple fracture may be converted into a compound or complicated one, especially where the bones are immediately under the skin, such as the collar bone and the shin bone.

Without removing the clothes, unless the fracture is compound or there is hemorrhage, bring the bones into their relative positions as follows: First, lift the limb by grasping it gently but firmly above and below the seat of fracture, then make gentle extension in the normal line of the bone. This should cause little or no pain. Fix the limb in this position by means of splints and bandages.

23–136. Splints.—Splints are supports used to immobilize joints and fractured bones. Many articles in daily use may be used to keep the injured parts in place. For instance, broom handles, newspapers, stockings filled with straw or sand, pieces of wood and laths can be employed. In the field we may make use of the branches of trees, pieces of bark, shrubs, rifles, and bayonets. The opposite leg can be used as a splint for the injured one (fig. 321), and in case of the upper extremity it can be splinted against the chest by snugly binding it there with bandages. Improvised splints should always be constructed of material sufficiently stiff to keep the parts in position; they should be made long enough to extend some distance beyond the joints between which the fracture lies. They should be as wide as the limb to which applied. Splints should be padded on the side next to the limb with some soft material, such as towels, blanket, cotton, wool, oakum, straw, flannel, bandages, etc. The padding should extend over the edges of the splint. (Fig. 320.)

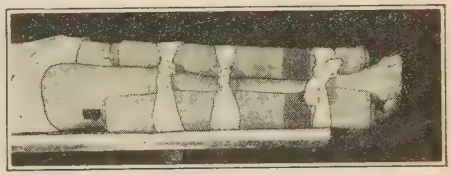


FIG. 320.—Improvised splint of sticks and blanket

FIG. 321.—Use of opposite leg as splint

To apply splints two persons are required; one gently lifts the injured part while pulling steadily in the line of the bone. This can sometimes be done with one hand; if so, the other hand should be put under the seat of fracture to support it. The second person applies the splints, one on each side of the limb, and fixes them in position by tying about them, above and below the line of fracture, triangular bandages, folded narrow, or straps, belts, suspenders, tapes, or rubber plaster. All knots should be tied over the outer splint and not over the bone. The general rule that injured parts should be elevated holds good in the case of fractures. The splint should not be applied so tightly as to impede circulation. If splinted limbs are allowed to hang down, swelling follows and the circulation may be dangerously cut off.

23–137. Treatment of a compound fracture.—Expose the wound by cutting away the clothes, check the hemorrhage and apply first-aid dressing. Then apply splints. The principal danger in these cases is wound infection. The commonest source of bacteria, or germs, is the skin of the fingers or the skin about the wound. Do not touch the wound with fingers, unless necessary to stop bleeding to save life.

23–138. Transportation.—Persons with broken bones should not be transported until the bones have been splinted. Faintness is apt to come on after a fracture. Usually persons suffering from fractures of the upper extremity can walk with assistance. Those suffering from fractures of the lower extremity should always be carried.

23–139. The injured person's care of himself.—Should the patient believe he has sustained a fracture, he should lie down carefully, and place the broken bone in a position found to be the most comfortable. Under no circumstances should he attempt to walk if a lower extremity has been injured, as in this way a simple fracture might be made compound, or the bone ends tear a large blood vessel.

Special Fractures

23–140. Fracture of the skull.—These injuries are very serious and should be treated by a medical officer as early as possible. Wound infection should be prevented by applying a first-aid dressing if necessary.

23–144. Fracture of the jaw.—Tie a triangular bandage, or handkerchief, under the chin and over the top of the head.

23–142. Fracture of the ribs.—Apply wide band of rubber plaster or several narrow bands two-thirds around the chest while the arms are held over the head and the chest emptied of air; or snugly apply wide bandages.

23–143.—Fracture of the collar bone.—Rest the arm on the injured side in a sling, and secure this arm to the chest by pinning the sleeve to the jumper, or by passing a bandage over and around the chest. (Fig. 322.)

FIG. 322.—First-aid treatment for fractured collar bone

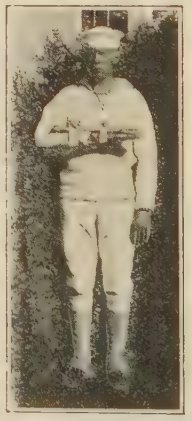


FIG. 323.—Fracture of forearm. Placed in sling after dressing

FIG. 324.—Dressing and sling for fractured arm

23–144. Fractures of the arm and forearm.—The proper method of dressing a fracture of the forearm is shown in Figure 323. The part should be

carried in a wide sling. Figure 324 shows the proper method of dressing a broken upper arm. It will be noticed that the sling does not support the elbow.

23–145. Fracture of the leg.—An ordinary pillow tied about a broken leg and reinforced by sticks, bayonets, or scabbard makes an excellent splint. (Figs. 320, 321, and 325.)

FIG. 325.—Pillow splint for fractured leg. Note method of placing man on stretcher

FIG. 326.—Fracture of thigh. Rifle used as splint

23–146. Fractures of the thigh.—A broken thigh is the most difficult to splint properly. The splint on the outside should extend from the armpit beyond the sole of the foot and that on the inside from the crotch to the foot.

In the field a rifle may be used instead of the long outside splint. The rifle butt is placed in the armpit, the trigger guard to the front. It should be secured at the points shown in Figure 326. The feet should be tied together, also the legs below the knee. This prevents the foot on the injured side from turning out.

Section IX.—HEMORRHAGE OR BLEEDING

23–147. Bleeding from an ordinary wound is usually stopped by exposure to the air or by the pressure of a wound dressing. In more severe cases some other method must be used, and quickly. Knowledge of methods of stopping hemorrhage may be the means of saving life. There may be no visible bleeding from internal hemorrhage.

Excessive loss of blood may cause faintness, cold skin, pallor of face, dilated pupils, feeble and irregular breathing, often sighing, a weak pulse, and eventually loss of consciousness.

Bleeding from **arteries** is most serious, and is recognized by bright red blood, expelled in squirts. The blood may be lost very rapidly.

Bleeding from **veins** is characterized by a steady flow of dark blood, and is only dangerous when from very large veins.

Bleeding from **capillaries**, which are the smallest blood vessels, is usually oozing blood.

23–148. Treatment.—(*a*) Check the hemorrhage.

(*b*) Place the person on back with the head low so that the brain will get as much blood as possible.

(*c*) Prevent any violent movements which might increase the bleeding. When the bleeding has ceased, the injured person should be kept quiet, for any movement may dislodge the clot and start the hemorrhage again.

(*d*) Give plenty of fresh air.

(*e*) Keep patient warm by whatever means possible and surround with hot-water bottles, if obtainable.

(*f*) Stimulants should be used with care, as they increase the force of the heart and promote bleeding.

(*g*) If a patient is in collapse, forcing the blood from the extremities to the heart by bandaging from the fingers to the armpits and from the toes to the body may save life.

23–149. To check bleeding from arteries.—Some knowledge of the general course of the main arteries is necessary. This may be obtained from a study of Figure 327. Also feel for the pulsation of these arteries in your own body to become familiar with their location and the amount of pressure necessary to arrest the flow of blood.

Press the fingers or the thumb on the artery between the bleeding point and the heart. Finger pressure is tiring and can not be kept up very long (usually

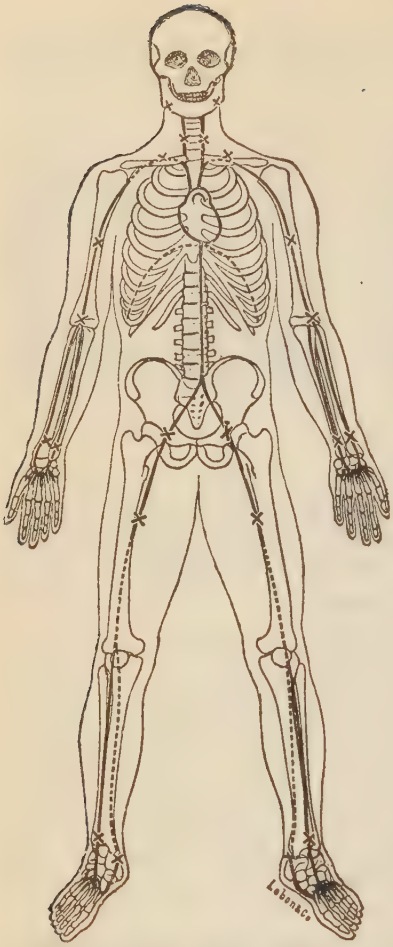


FIG. 327.—Skeleton with black and dotted lines showing the course of the arteries and x indicating the pressure points. (Mason.)

not longer than 15 minutes), so other methods must be used to control the hemorrhage until clotting has taken place and the bleeding permanently stopped.

1. Bleeding from any part of the scalp may be stopped by a tight bandage encircling the head, across the forehead, above the ears.

2. All other arterial bleeding from the **head and the upper part of the neck** should be checked by pressure on the carotid artery, which supplies that region. Press backward deeply into the neck with the thumb or fingers to the inner side of the plainly seen muscle which extends from the upper part of the breast bone to behind the ear (fig. 328).

3. Wounds of the **great vessels of the neck** are so extremely dangerous that direct pressure on the bleeding point should be made at once.

4. Bleeding about the shoulder may be checked by compressing the subclavian artery behind the middle portion of the collar bone (fig. 329).

5. Compression of the brachial artery will control bleeding from any part of the arm or hand. This artery may be compressed by pressure outward against the bone at the inner border of the biceps (fig. 330).

6. In bleeding from the lower extremity pressure on the femoral artery will control it. This pressure should be made at the middle of the groin, 4 fingers' breadth below the fold (fig. 331).

7. Bleeding from the leg may be controlled by placing a pad behind the knee and bending the knee sharply on the pad. Apply a bandage to keep the leg against the thigh. This method may be used at the elbow.

23–150. A tourniquet is an appliance used to constrict the arm or the thigh, and by so doing control hemorrhage. There are many forms of tourniquets, most of them having a pad to press on the artery and a strap to apply pressure. One

FIG. 328.—Pressure on carotid artery to control bleeding from head and upper part of neck

FIG. 329.—Pressure on subclavian artery behind collar bone to control bleeding about shoulder

may be improvised with a smooth stone wrapped in some material to make it softer, and a handkerchief or other similar articles (fig. 332). The Navy tourniquet is an elastic rubber tube. This should be bound tightly around the limb and its ends secured by tying. The tourniquet is very useful but may be very danger-

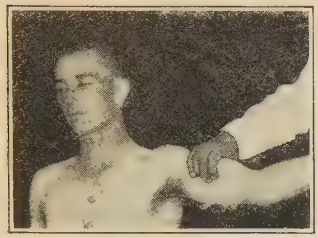


FIG. 330.—Pressure on brachial artery to control bleeding in arm and hand

FIG. 331.—Pressure on femoral artery to control bleeding in lower extremity

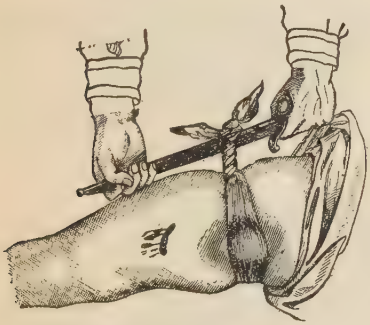


FIG. 332

ous. It should not remain on longer than one hour without loosening, as there is danger that the lack of blood supply will cause death of the part. If the bleeding starts again then pressure must be applied as before. If pressure is made in the wound itself place a first-aid pad or a clean piece of cloth over the wound and make pressure through this. Only if absolutely necessary should a finger come in direct contact with a wound.

Elevation of the part aids in controlling hemorrhage.

Section X.—THE APPLICATION OF FIRST-AID DRESSINGS

23–151. The first-aid packet contains two compresses made of folds of gauze bandage and two safety pins. The dressings are wrapped in wax paper inside a waterproof metal case. The two compresses are for the two wounds—that of entrance and that of exit of bullet. Gauze tails hold the compresses in place, and may be secured with the safety pins.

Skill in the application of these dressings can be acquired by frequent drills.

Large dressings are furnished for use on shell wounds. They are backed by muslin and have four tails for securing around the body. The muslin goes outside and the gauze next to the wound. Open the package and apply without touching the gauze with your fingers.

23–152. The immediate treatment of gunshot wounds differs in some particulars from the treatment of wounds in general.

(1) Under no circumstances attempt to disinfect or wash the wound.

(2) The wound is not to be touched with the fingers. Avoid handling that part of the dressing which will come in contact with the wound. The danger of infection from fingers is very great and may lead to more serious results than the bullet itself.

(3) Care must be taken that the compresses do not slip off the wound.

(4) In dressing wounds of the scalp part the hair or cut away some of it before the compress is applied.

(5) If necessary, the clothing should be slit up with a knife.

(6) The majority of wounds heal under a single dressing.

(7) Under no circumstances should dried blood crusts and scabs be disturbed.

23–153. The wounded person's care of himself.—(1) Apply the first-aid dressing and compress the bleeding vessel in the wound through this dressing.

Elevate the part, loosen constrictions, and apply a "Spanish windlass." Lie down and remain quiet. If the bleeding is profuse, press the great vessel supplying the part against the bone and apply a "Spanish windlass" made with a neckerchief or a triangular bandage and tightened with a stick or bayonet.

(2) After the checking of dangerous hemorrhage the prevention of germ poisoning is of the greatest importance. Carefully get out the first-aid packet, seeing that none of its contents is dropped on the ground and that the fingers do not touch the parts of the compress likely to lie in contact with the wound. Do not disturb crusted blood on the dressing near the wounds. If the wound is out of reach and can not be dressed at once it should be left exposed to the air until assistance comes. If there is little pain, no throbbing, and no fever, be contented, for the wound is doing well and will probably heal under a single dressing.

23–154. Gas casualties.—The first-aid treatment of these cases depends upon the type of gas encountered. The gas officer will furnish this information after a gas attack starts. Remove patients from gas area as soon as possible. Keep masks in position until out of gas zone.

23–155. Tear gases.—To relieve irritation resulting from tear gases, wash out the eyes with boric-acid solution or weak baking-soda solution or limewater. **Do not bandage the eyes.**

23–156.—Lung irritants.—First-aid treatment for gases of this type consists of loosening the clothing and making the patient lie down and remain quiet. If moved, they should be considered stretcher cases and must not be allowed to exert themselves.

23–157. Vesicants (blistering gases).—All men who have been exposed should be given a complete bath and a change of clothing as soon as conditions permit. Wash out the eyes with boric-acid solution and apply weak sodium-bicarbonate solution (baking soda) to affected parts. Rest and body warmth should be maintained.

Section XI.—THE PREPARATION OF THE WOUNDED FOR TRANSPORTATION

23–158. First-aid dressings should be applied and broken bones immobilized with splints. Figures 333 to 344 show the methods of carrying the wounded with one or two bearers. Sometimes patients may be carried pickaback. When two bearers are available the patient may be carried in a seat formed by the hands of the bearers or by the fore-and-aft carry—one bearer placing himself between the knees of the patient, facing in the direction of march and supporting the patient by a grip under each knee. The other bearer grasps the patient from behind under the armpits and clasps his hands across the patient's chest.

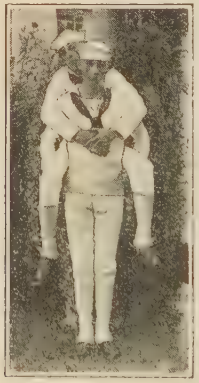


FIG. 333.—Pick-a-back carry

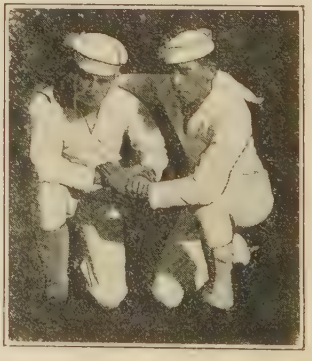


FIG. 334.—Forming seat for patient

23–159. Where only one man is available to carry the injured.—In a situation where only one man is available to carry the injured man to shelter or to an emergency dressing station the best method of carrying the injured man will depend upon the nature and seriousness of his injury, the nature of the field or place, the battle situation, etc. Because of these factors, the particular

FIG. 335.—Carrying patient in seat formed by hands

FIG. 336.—Fore-and-aft carry

FIG. 337.—In arms carry. Completion first step

method of carrying the man must be left to the best judgment of the man who is to carry him.

(1) **In arms carry.**—If the general situation permits your carrying the injured man in your arms, the accepted method is as follows: Turn the injured man over on his face, step astride his body, facing toward his head. With your hands under his armpits, lift him to his knees; then clasp your hands under his stomach (abdomen) and lift him to his feet. With your left hand clasp the injured man's left wrist and draw his left arm around your neck, holding it against your left chest, with the injured man's left side resting against your body, supporting him with your right arm around his waist. This completes the first step. (See illustration fig. 337 for a picture of this first step.)

FIG. 338.—In arms carry. Final step

From this position, with your right arm around the injured man's back, pass your left arm under his thighs and lift him into position, carrying him well up. (See illustration fig. 338 for completion of the second and final step.)

(2) **Across-back carry.**—A second method of transporting an injured man is that of across-back carry. The method of getting the injured man upon your back in the proper manner is as follows: Lift the wounded man erect, or as nearly so as practicable, as in "In arms carry." Seize his right wrist with your left hand and draw his right arm over your head and down upon your left shoulder, leaving your right hand free. (See illustration fig. 339 for completion of the first step.) Then shift yourself in front of the man, stoop, sustaining part of his weight upon your shoulders and back, thrust your right hand and arm between his legs, clasping his right thigh with your right arm. Shift his left wrist to your

right hand. Now grasp his left hand with your left hand. (See illustration fig. 340 for completion of the second step.)

As you stand up, steady his left hand against your side. (See illustration fig. 341 for final step.)

(3) **Tied-hands crawl or carry.**—The condition of the field or battle situation may render it impossible to attempt to take a man to the rear or to a dressing station by any of the previously mentioned methods. But it may be possible to take a man to shelter or to the rear, crawling along with him secured over your back and in this way partly avoid open view, high machine-gun fire, snipers, etc. In such a situation the following method, known as the tied-hands crawl or carry may prove valuable. (See Fig. 344).

FIG. 339.—Across-back carry. Completion first step

Lay the man to be carried on his back and place yourself upon your back by his left side, your head in the same direction as his. Grasp his right arm above the elbow from its under side with your right hand. With your left hand grasp his same arm below the elbow, from the top side. (See illustration, fig. 342, for first step.) Then, keeping the right side of your body slightly upon the man's body and entwining your legs around his own, roll over onto your belly, pulling the man with you. The man should now be lying face down on your back, with his left arm free and over your left shoulder. (See illustration, fig. 343, for second step.) Next draw the man's free arm under your left armpit. Secure both wrists of the man with any available material (cloth, bandage, neckerchief, handkerchief, etc.). You may then crawl with the man in this position, or, when necessary, rise erect and climb ladders, or, if it is desired to

carry him pickaback, reach behind and support his legs. This method may be varied by tying the man's wrists together first and then lying down on top of him and inserting your head and shoulders through the loop formed by the man's tied wrists. (See illustration, fig. 344, for final step.) Should the man's right arm be injured, place yourself on your back by his right side and grasp his left arm instead of his right, substituting your right arm or hand where the left is indicated in the text, and vice versa.

23–160. Handling a stretcher.—The method of placing a wounded man on a stretcher is shown in Figure 325. An overcoat, blanket, pack, or other suitable article may be used as a pillow. If the patient is faint, the head should be kept low. Difficulty in breathing due to wounds of the chest is sometimes relieved by judicious elevation of the shoulders. In wounds of the abdomen the best

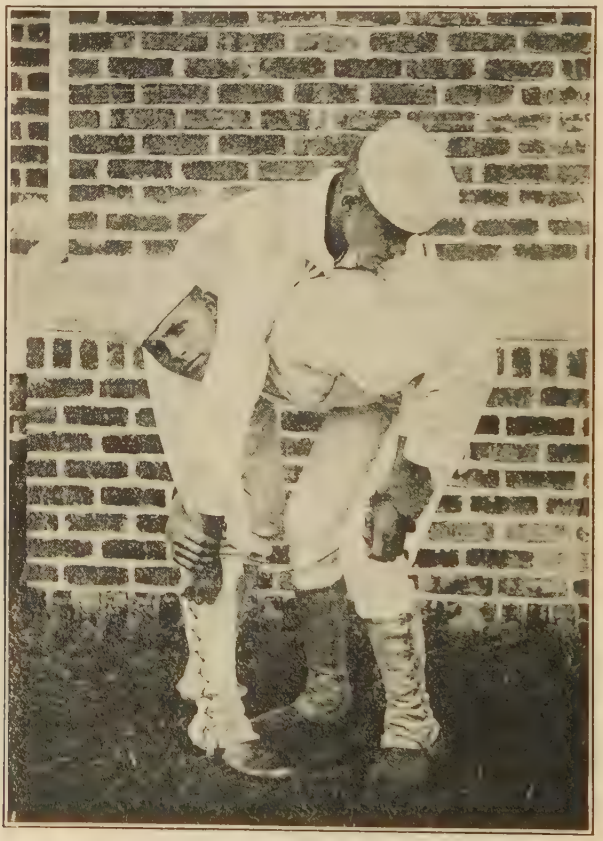


FIG. 340.—Across-back carry. Completion second step

position is on the injured side, or on the back if the front of the abdomen is wounded, the legs being drawn up and supported. In injuries of an upper extremity the best position is on the back with the arm across the body or suitably placed by the side. In injuries of a lower extremity the patient should be on the back or inclined toward the wounded side. Patients should be handled carefully and as gently as possible to avoid jarring the injured part.

Bearers should not keep step. The handles of the stretcher should be carried at arms length, and care should be taken to keep the stretcher level, especially over uneven ground.

The patient should be carried feet first, but in going up a steep incline head first except in case of fracture of the lower extremities, when the feet should be first going up and the head first coming down to prevent the weight of the body from pressing on the injured part.

FIG. 341.—Across-back carry. Final step

FIG. 342.—Tied hands crawl. Completion first step

FIG. 343.—Tied hands crawl. Completion second step

FIG. 344.—Tied hands crawl. Final position. This position or crawling on the stomach is most useful in effecting rescues under high fire. When the rifle or machine-gun fire is low, it may be safer to use a standing carry, risking being shot in the legs, than a crawl carry and risk being shot in the body.

23–161. Improvised stretchers. Among the articles that may be employed as stretchers are boards, window shutters, doors, bed frames, mattresses, benches, tables, chairs, blankets, rugs, hammocks, etc. Rifles or poles may be passed through openings made in the bottom of sacks; or coats or trousers may be used. The rifles or poles can be prevented from spreading too far apart by a turn of rope or telegraph wire.

An improvised stretcher should always be tested before placing a patient on it.

23–162. The rifle stretcher.—Spread a blanket on the ground, lay two rifles (magazines empty) across the middle, 20 inches apart, both muzzles pointing in the same direction, trigger guards outward. Turn a fold of the blanket 6 inches wide over the ends of the butts, fold the right side of the blanket over the rifle on that side as far as the rifle on the opposite side, then, similarly, fold the left side. These folds of blankets form the body of the stretcher, the butts forming the head.

23–163. The pole-and-blanket stretcher.—Place two poles along the edges of a blanket and roll the sides snugly over the poles until 20 inches apart. The blanket should be tied to the poles, which may be braced by spreaders.

Chapter 24

MAPPING AND SKETCHING

Section I.—MAP MAKING

24–1. Maps are indispensible in the field; without them it is impracticable to conduct the simplest operations with skill and efficiency, and reports of operations are usually incomplete unless accompanied by a sketch or map.

24–2. Usually maps of some kind are available, but these are often on too small a scale for military use, and experience has shown that they are often inaccurate and misleading. Moreover, commercial maps do not contain the necessary data or information required for military operations. The data a military map should contain consist of all those features which are important in military operations, such as the width and condition of roads; grades and slopes; type, strength, and material of bridges; width, depth, and velocity of streams; location of woods, camp sites; positions of defense, etc. (see art. 24–41 et seq.).

24–3. There are several kinds of maps, some or all of which may have to be prepared, as follows:

(1) **Road sketches.**
(2) **Position sketches.**
(3) **Place sketches.**
(4) **Landscape sketches.**

24–4. **A road sketch** is the type most often required. It consists in mapping a road or trail from a given starting point to a given finishing point, including a belt about 300 yards wide on each side of the road. All features of military importance, including the configuration of the country, are required.

Road sketches are usually made on a scale of 3 inches to the mile, i. e., 3 inches on the map represent 1 mile on the ground. The scale of the map must always be shown, otherwise it will convey no information as to distance. This applies to every kind of map except a landscape sketch.

24–5. **Position sketches** are those which show an area, rather than a belt of territory, as in a road sketch. They are made when it is desired to map an occupied position, such as a battle field or outpost position. The area must cover the position held by our own troops as well as the area in front toward the enemy. The scale of a position sketch is usually 6 inches to the mile because more detail, particularly with regard to cover and accuracy as to ranges, is required. In siege operations or where otherwise necessary the scale is as large as 12 inches to the mile.

24–6. **Place sketches** are required for the same purpose as position sketches and are made on the same scale. For a position sketch all the area to be mapped can be covered by sketching parties, whereas a place sketch by reason of the inaccessibility of part or all of the area, as for example, where it is in enemy territory, must be sketched from one or more positions on elevated ground within our own lines, or within close proximity to them.

24–7. **Landscape sketches** are in fact pictorial drawings. They are used to amplify and make clear the area shown by a place or position sketch. No scale is used. The location of the sketching station must be properly indicated on the sketch.

Scales

24–8. The scale of a map can be indicated in several different ways, the most usual of which are the following:

(1) By **words and figures**: 3 inches=1 mile.
(2) By what is known as the **representative fraction**, abbreviated "R. F.," thus: R. F.$=\frac{1}{21120}$.

The numerator of the R. F. is always unity, and may represent any unit of measure (inch, foot, meter, etc.). The denominator of the R. F. indicates the number of units of measure *on the ground* represented by one of the *same units* on the map.

(3) **Graphically**, by drawing a line of certain length and subdividing it into units which represent the number of yards or miles on the map. This is called **a reading scale.**

24–9. Figure 345 shows the scales most commonly employed. The reading scales are accurate within approximately 1 per cent and may be used in the preparation of working scales.

24–10. A **working scale** is for convenience in map making. It differs from a reading scale only in the units in which it is graduated. These units may be those of distance (for example, the length of 1 pace of the individual who is making the sketch), or of time (for example, the distance traveled in 1 minute by the individual, or horse, at his normal stride). The former is more accurate; the latter is more convenient when the sketcher is mounted.

24–11. (1) The unit of measure generally employed to make a working scale is the length of the sketcher's pace. This differs with the individual, and must be accurately known. To determine the length of the pace, an accurately measured distance, say 100 yards, is laid out with a tape and marked. Pace this distance carefully a number of times without increasing the cadence or length of your normal pace. Reduce the measured distance to inches and divide by the number of paces required for 100 yards; the resultant gives the length of your pace. Where the length is found to be, say, 30 and a fraction inches, call the stride 30 if the fraction is less than one-half inch and 31 if more than one-half inch.

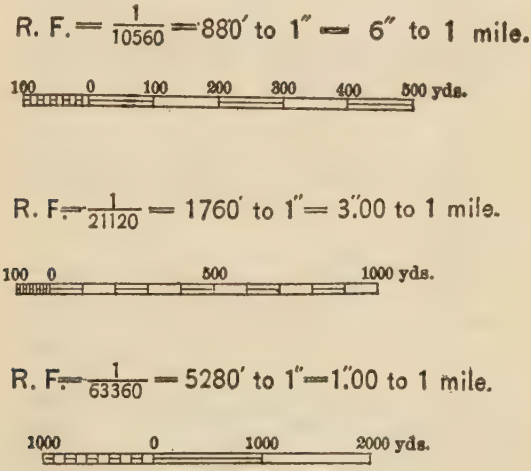


FIG. 345

The topographer should know the length of his stride and check it very carefully. This is particularly important in ascending or descending hills and traveling through different kinds of brush and undergrowth. Correction for these errors may be made by adding or dropping a certain number of paces for every so many paces taken. Another source of error creeps in due to the difference in stride of a person that is fresh and well as compared to one that is in poor health or fatigued.

The working scale curve of paces is shown in true size in Figure 346. Using the line appropriate for the length of your pace and the scale on which the sketch is to be made, mark a piece of paper with the intervals as on the scale. The working scale is marked in single paces. It is usually more convenient to count double paces (strides)—i. e., the number of times the left foot strikes the ground—in which case mark the divisions on the scale as appropriate for double paces.

Make your working scale about 6 inches long. Mark the *second* division zero, then the third; fourth, etc., 1, 2, etc., representing 100, 200 etc., paces. Subdivide the division to the left of the zero mark to represent 25, 50, 75, and 100; this enables you to measure distances accurately which are less than 100 paces, or other measure less than a whole division of the scale.

(2) The working scale for time is constructed in a similar manner. It is based on the principle that equal distances will normally be passed over in equal

times. Pace a known distance a number of times and note the time required to cover this distance. Then compute the time in minutes required to cover 1 mile. The scale can then be made from the working scale curve of time, shown in true size in Figure 347.

Contouring

24–12. Contouring is the method by which the slopes and physical features of the ground are shown on a map. A **contour line** (or **contour**) is one that

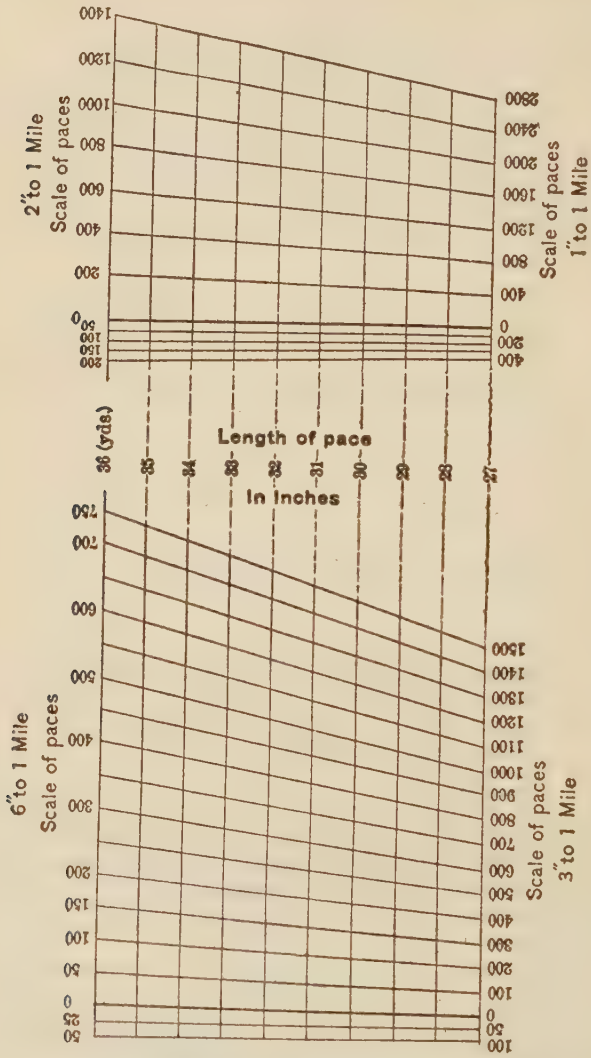


FIG. 346

connects all points of equal height above a horizontal plane known as the **datum plane**. The datum plane is ordinarily taken to be at sea level, and all heights shown are the actual heights above this plane.

Contour lines have certain characteristics. A knowledge of these is essential in map reading or in locating contours on a map.

(1) A contour line never joins or crosses another contour except in rare cases, as described in subparagraph (*8*).

(2) When spaced at a uniform distance they indicate a uniform slope.

(3) When closely spaced they indicate a steep slope and when far apart a gentle slope.

(4) When spaced close together near the top of a hill and far apart at the bottom they indicate a *concave* slope; and, vice versa, a *convex* slope.

(5) A typical contour line is a wavy line, alternately salient and reentrant.

(6) When a contour line joins itself it indicates an elevation or depression in the included area.

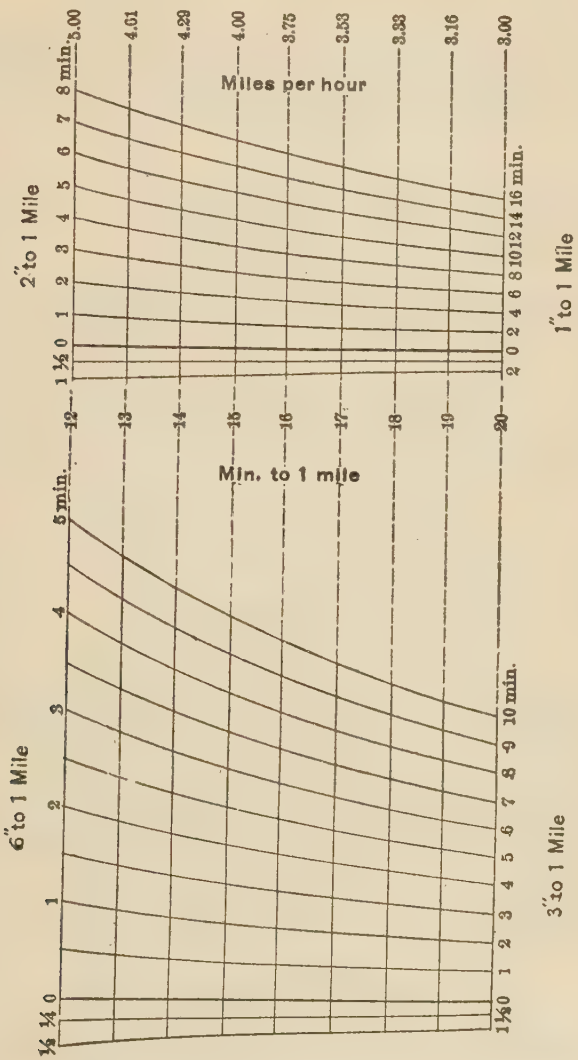


FIG. 347

(7) Contours that cross streams or gullies invariably run upstream, i. e., as the contour line approaches a stream it curves sharply toward the source and then at the crossing curves sharply in the other direction.

(8) Where contour lines of different elevation meet, it indicates a cliff at that point. In very rare cases the upper contour may cross the lower, which indicates an overhanging cliff.

(9) Maximum ridge and minimum valley-contours go in pairs. A single lower contour can not lie between two higher ones, or a single higher between two lower. When two adjacent contours have the same elevation the ground between them will be still lower if they are valley, and still higher if ridge contours.

24–13. By **contour interval** is meant the difference in elevation, measured in feet, between points on adjacent contours; it is also called **vertical interval** (abbreviated "V. I."). On a map the elevation of contour lines above the datum plane is indicated by marking certain ones with their elevation.

The contour interval depends on the scale of the map. With a uniform contour interval a small-scale map would have the contours spaced so closely together that it would be impossible to show other important details; and, on the other hand, a contour interval suitable for a small-scale map would fail to show the necessary details required for a large-scale map. For this reason the following standard has been adopted for United States military maps:

Scale:
- 1 inch to the mile, contour interval 60 feet.
- 3 inches to the mile, contour interval 20 feet.
- 6 inches to the mile, contour interval 10 feet.
- 12 inches to the mile, contour interval 5 feet.

24–14. **Map distance** (M. D.) is the actual distance *on the map* between two adjacent contour lines, at a given point and in a given direction. It is usually expressed in inches and fractions of an inch. It is also called the **slope equivalent.**

The **horizontal equivalent** (H. E.) is the actual *horizontal distance* between adjacent contours on the ground. It is usually measured in feet. It is the base of a right triangle whose altitude is the vertical interval, whose hypotenuse is the actual ground distance between contours, and whose lower acute angle is the angle of slope (S).

$$\text{M. D.} = \text{H. E.} \times \text{R. F.} \times 12, \text{ and}$$

$$\text{H. E.} = \frac{\text{V. I.}}{\text{tang.}\,S} = \frac{\text{V. I.}}{S\,\text{tang. }1^\circ} = \frac{\text{V. I.} \times 57.3}{S},$$

$$\text{therefore M. D. (in inches)} = \frac{\text{V. I. (in feet)} \times 688}{S\text{ (in degrees)}} \times \text{R. F.}$$

Slope equivalent.—Common engineering usage refers to grade in percentage, ratio of height to horizontal distance—a 1 per cent grade being a rise (or fall) of 1 foot per 100 feet; a 5 per cent grade, 5 feet per 100—or the vertical difference divided by the horizontal distance between two points gives the grade percentage. This is generally used in preliminary location of roads whose grade is fixed at some per cent, the path of the road being traced primarily by determining the line having such ratio between adjacent contours.

24–15. A scale of map distances shows the respective map distances for a slope of 1°, 2°, 3°, etc.

To construct such a scale it is only necessary to substitute values in the preceding equation, and lay off the resulting distances on a right line. For example, if the scale of the map is 3 inches to the mile, we have

$$\text{M. D. for } 1^\circ = \frac{20 \times 688}{1} \times \frac{1}{21120} = .65 \text{ inch.}$$

The distance for 2° is one-half of the distance for 1°; for 3° it is one-third, etc. (see fig. 348).

24–16. Map distances afford a convenient and rapid method of determining contour points on any line of a map the gradient of which is known.

The method employed is as follows: Standing at a point on the terrain corresponding to one end of the line, determine the gradient by means of the slope board (see art. 24–23), or if the slope is not uniform, determine the gradient to the point where the slope changes; note this point, determine its distance from

the starting point, usually by pacing, and having arrived at the point of change of slope, determine the gradient of the next section of the line, and so on. Then lay off on the map successive contour points at a distance apart equal to the map distance for the observed slope, stopping at the point corresponding to the change

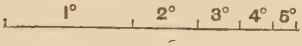


FIG. 348

of slope. Proceed in similar manner for succeeding sections of the line. Where any point of change of slope does not exactly coincide with a contour point, the remaining fraction of the map distance corresponds to the same fraction of the vertical interval; and the remaining fraction of the vertical interval is then reduced to a corresponding fraction of the map distance for the new slope.

A similar adjustment is made in locating the first contour point on a line, if the starting point falls between contours.

24–17. It will not be practicable to draw in contour lines accurately without a complete traverse of the hill or slope to be contoured. In such a case control lines marking the prominent ridges and depressions must be plotted and the points where the contours cut these lines noted. Later the points of equal elevation must be connected and the heights of these shown, after which the control lines may be erased.

For ordinary sketches it is only necessary to show the **form lines** of the hill or slope—by which the form of the hill, the steepness of the slope, and its approximate height, as well as the position of the hill with regard to the road are plotted on the sketch.

Section II.—MAP READING

24–18. While only a comparatively small number of officers will in general be required to make maps, skill in map reading is of the first importance for all officers.

The ability to read maps, such as the one shown in Figure 359 can be readily acquired with a little practice and study. In map reading, it is not only important to visualize the configuration of the ground by understanding what is represented by the contours, but also a familiarity with the conventional signs is required. For the most part these are easy to learn because they represent graphically what they are intended to show. The most usual conventional signs are shown in Figure 349.

In using these signs in map making, care should be taken not to crowd the map to such an extent as to hide the salient features of importance. Modern practice permits the outline of woods, orchards, cultivated fields, etc., to be indicated by an outline with the words "woods," "orchard," etc., written within to show what is represented.

For a more complete table of conventional signs and the use of colors in map making, the map maker should consult the chart of standard symbols adopted by the Board of Surveys and Maps, United States of America, published by the United States Geological Survey.

The following abbreviations are authorized for use on field maps and sketches.

Abbreviations

a. ---- arroyo.
aa---- antiaircraft.
ab---- ambulance.
abut-- abutment.
ae---- airdrome.
am---- ammunition.
ar---- arch.
b----- brick.
ba---- base.
bh---- heavy pontoon bridge.
bl---- light pontoon bridge.
B.S--- blacksmith shop.
bot--- bottom.
Br---- branch.
br---- bridge.
C----- cape.
c------ camp.
ca---- camouflage.
cac--- coast artillery.
cem--- cemetery.
cn---- communications.
con--- concrete.
cov--- covered.
cr---- creek.
cul--- culvert.
cvh--- convalescent hospital.
d----- deep.
de---- depot.
di---- dispensary.
do---- district office.
ds---- drug store.
E----- east.
e------ engineers.
emb--- embarkation.
est--- estuary.
ev---- evacuation
evh--- evacuation hospital.
f------ fordable.
fa----- field artillery.
Ft---- fort.
g------ chemical warfare.
geh--- general hospital.
ghq--- general headquarters.
gs---- general store.
gir---- girder.
gm---- gristmill.
h------ hospital.
hq---- headquarters.
hw---- highway.
hz---- howitzer.
i------ iron.
I------ island.
Jc---- junction.
ki---- kitchen.
kp---- king-post.
l------ lake.
Lat--- latitude.
ldg---- landing.
lh---- lighthouse.
lm---- light mortar.
Long-- longitude.
lr---- lumber.
lss---- life-saving station.
m----- medical corps.
md---- medicine.
mg---- machine gun.
mr---- motor repair.
mt---- mountain.
mts--- mountains.
N----- north.
nc---- nurse corps.
n f---- not fordable
p------ pier.
pg---- proving ground.
pk---- park.
pl---- postal.
pn---- pigeon.
P O--- post office.
Pt---- point.
q------ quartermaster
q p--- queen post.
r------ river.
rh---- railhead.
ry---- railway.
S------ south.
s------ signal corps (also used to designate service company of regiment).
sa---- small arms.
sg---- salvage.
s h--- schoolhouse.
s m--- sawmill.
sp---- shop.
st---- station.
str--- stream.
su---- surgical.
suh--- surgical hospital.
tm---- trench mortar.
t g--- tollgate.
tr---- training.
tres-- trestle.
v------ veterinary
w t--- water tank.
w w--- water works.
W----- west.
w------ water.
wi---- width.
z------ zone.

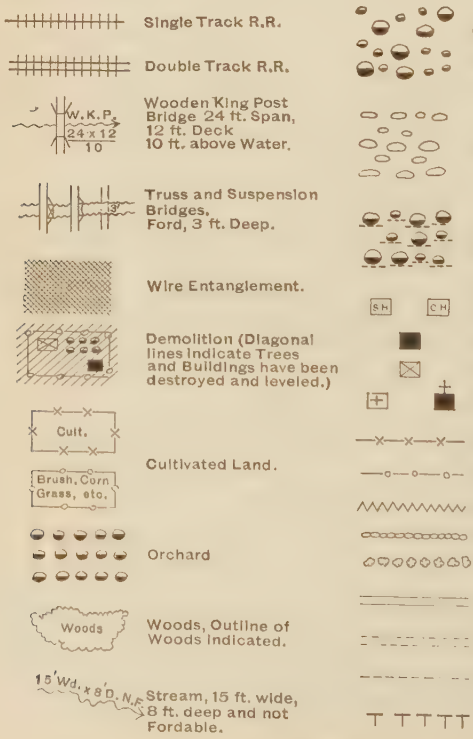


Fig. 349

24–19. The ability to read contours quickly and accurately is most readily acquired as follows: Pick out a road or stream on the map and consider yourself at some given point, proceed along the road or stream and visualize the configuration of the country as you go.

24–20. A series of most important problems in this connection is the class known as **visibility problems.** Select two points on a map, consider yourself at one of them, and determine whether or not the other point is visible from the assumed point. The problem can be solved in several ways:

(1) **By making a profile.**—This is done by connecting the two points by a right line, and constructing a profile, as indicated in Figure 350. In this case it is desired to determine if the bridge at *C* can be seen from the observer's station on the hill at *A*. In this particular problem, the bridge and observer's station are connected by the road *ABC*, which is straight, and no other right line need be drawn between the stations for construction of the profile.

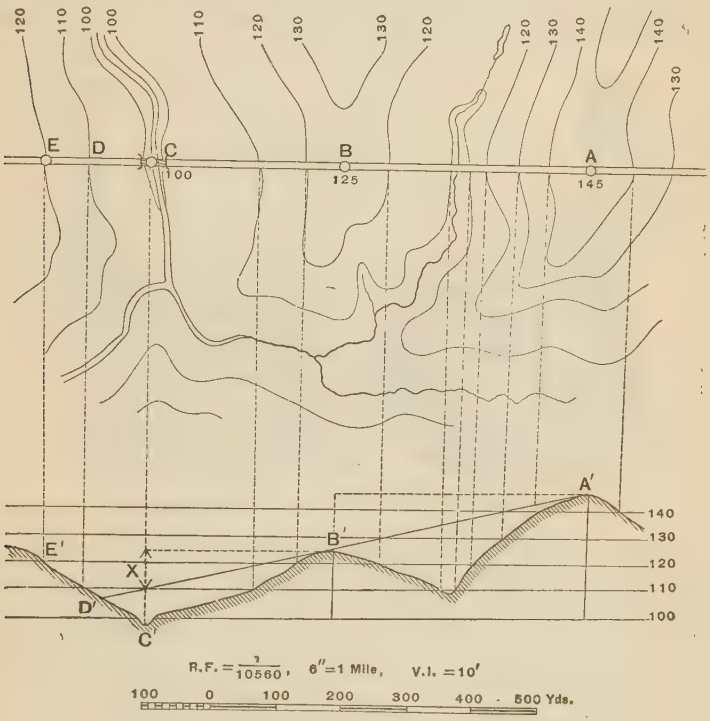


FIG. 350

After constructing the profile draw a tangent from *A′* to *B′* and prolong it to *D′*. It can be readily seen that the lower limit of visibility is *D′*, and as the bridge *C′* is below this point it can not be seen from the observing station at *A′*.

(2) **By ratio and proportion.**—This method is the one most usually employed. It is quicker than the profile method and just as accurate.

Assume the observer's station as *A* and take the bridge at *C* for determination of visibility as before.

Observe the point between *A* and *C* which is most likely to obstruct the view of *C*. This point appears to be on the hill at *B*. Measure the distance from *A* to *B* with the scale of the map, and say the distance is found to be 400 yards. Similarly measure the distance from *B* to *C*, which is found to be 290 yards. Note that the difference in elevation between *A* and *B* is 20 feet (145 − 125), and the difference in elevation between *B* and *C* is 25 feet (125 − 100). That is, the observer is 20 feet above, and the bridge 25 feet below, the obstructing point.

Then if x represents the greatest vertical distance below the level of the obstructing point which can be seen,

$$x : 20 = 290 : 400$$

or—

$$400x = 20 \times 290$$

$$\therefore x = 14.5 \text{ feet.}$$

But since C is 25 feet below B it is 10.5 feet lower $(25 - 14.5)$ than the lowest point that can be observed from A, and is therefore not visible from A.

Section III.—INSTRUMENTS

24–21. The compass.—There are two general forms of this instrument, one of the fixed and the other of the movable card type. The most usual forms are shown in Figures 351 and 352; the prismatic compass of movable card type and the box compass of fixed card type. The card of the box compass is graduated counter-clockwise from N. 360° to N. again; that of the prismatic compass is similarly graduated, but in a clockwise direction.

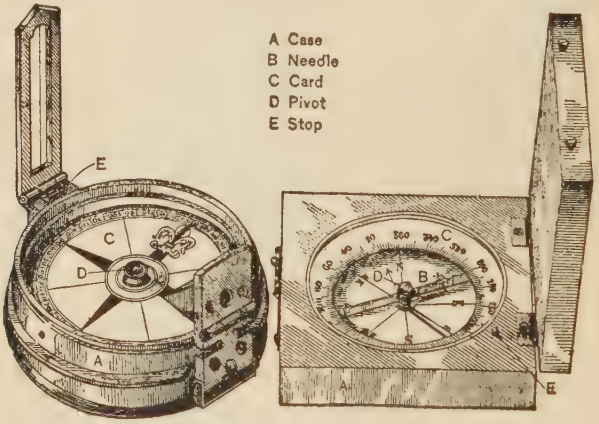


FIG. 351 FIG. 352

The compass must be held in a level position to permit an accurate reading. Bearings are taken by means of the sights in the prismatic compass, and by sighting along the box lid in the box compass. The reading is taken by shifting the eye to the reading prism or needle without changing the position of the instrument.

The latest type of prismatic compasses are equipped with a clinometer giving, in some cases, the angle of slope expressed in degrees, in others centimeters per meter or inches per yard as desired. The clinometer is so fitted that the compass must be turned on its side for use in determining slope. When a compass is so equipped the use of the slope board, described later, is obviated.

24–22. The declination of the compass (also called variation) is the angle the compass needle makes with the true north, and for ordinary latitudes may vary from 20° W. to 20° E. For high latitudes the declination is greater and more irregular. Abnormal deflections of the needle due to local disturbances are sudden and erratic. In plotting the result of a traverse, abnormal deflections, therefore, should not be distributed among all the courses of the traverse, but only among those in which there is reason to believe the disturbance occurs.

A simple way to detect—not measure—such disturbances is to take frequent back sights. If the position of the needle is normal at both stations, the sight and back sight will differ by 180°. If there is local attraction on the course, it will usually be stronger or cause greater deflection at one station than the other, and the sight and the back sight will not differ by 180°. A good needle requires time to settle even when the case is firmly supported, and the user should cultivate the knack of catching it at the middle of the swing, which is the desired reading. Always sight a *fixed card* compass from the south end of the card and read the north end of the needle.

With the prismatic compass the reading is taken through a reflecting, inverting, magnifying prism. The prism revolves on an axis and is over the circumference

of the card for reading, and against the edge of the case for carrying. It slides up and down the support which attaches it to the case, thereby permitting it to be focused on the scale.

24–23. The slope board is a simple instrument made to read slopes, and is constructed as follows: Drop a perpendicular from the point C, on the sighting edge of the board. With a radius of $5\frac{3}{4}$ inches, scant, describe the arc ADB. A chord of $\frac{1}{10}$ of an inch will then subtend an angle of 1° at C, and the circumference of the semicircle can then be graduated as shown in Figure 353.

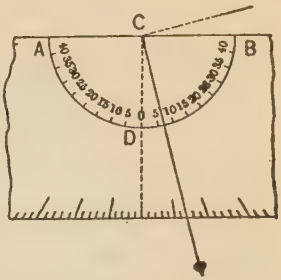


FIG. 353

The plumb bob is suspended by a string from the point C, and the slope is readily determined by sighting at the object while holding the board in a vertical plane. When the line is steady the board is quickly tilted so as to draw the line across the scale.

24–24. The drawing board is a thin, smooth, rectangular board 12 by 15 inches, to which the paper is attached by thumb tacks or rubber bands.

24–25. The sketching case in its simplest form is shown in Figure 354. This type is known as the **Cavalry sketching case.**

The compass is set in the board and a movable index is provided, which can be revolved to place it parallel to the assumed meridian on the map. When the needle is brought parallel to the wires the board is said to be **oriented.** The needle may be parallel to the index wires, but end for end, or 180°, out of its true position, in which case the sketcher is turned completely around. Such a mistake is so obvious that it needs no preventive, but a sketcher may note at the outset whether the north or south end of the needle is toward the stud which is used to move the index wires.

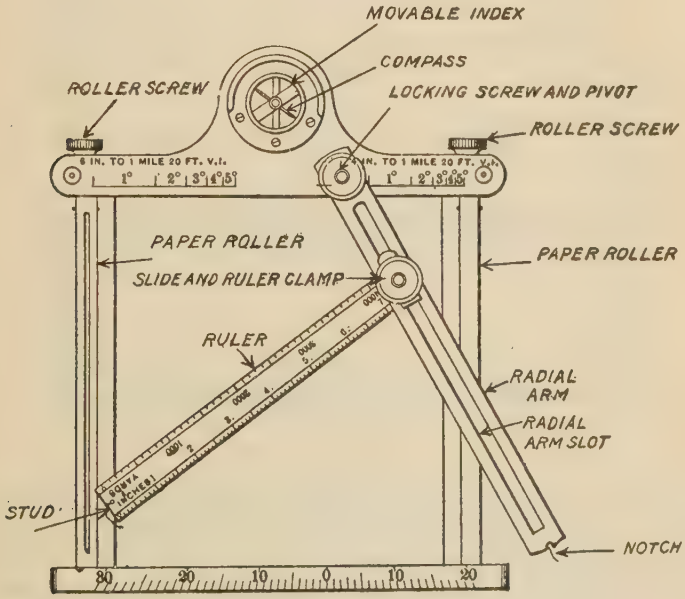


FIG. 354

The **ruler,** marked in inches and yards, is pivoted to a **slide,** moving in a slot in the radial arm, pivoted in turn to the board near the compass. The screw clamp clamps the ruler and slide with respect to the arm, and the locking screw clamps the arm to the board. The combination permits the ruler to be set on any point of the board and in any direction through that point and clamped there.

To facilitate road sketching, rollers are provided on which 30 or 40 inches of paper may be placed. The paper should roll on and off the undersides of the rollers.

To use the board as a slope board, loosen the locking screw and the ruler clamp; secure the ruler to the radial arm by inserting the stud at the end of the ruler in the notch at the end of the radial arm; tighten the ruler clamp. The ruler and radial arm then swing free from the pivot near the compass. The tops of the roller screws are then used as a sighting line and the angle is read from the left edge of the arm, on the scale at the bottom of the board.

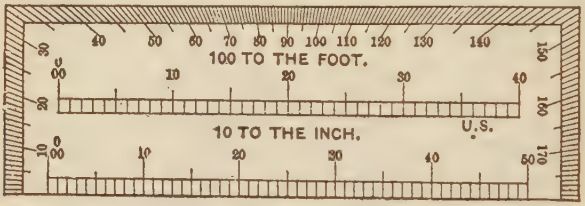
A scale of map distances from 1° to 5° slope, for 6-inch and 4-inch scales, is marked on the case below the roller screws; from these the map distance scale for any scale of map can readily be constructed.

24–26. The **plane table** in its simple form is a sketching case or drawing board mounted on a light tripod. The compass may be mounted on the board or separate from it. The board is leveled by the eye, or a small spirit level may be used. The **alidade** which is used in sketching with the plane table is a small flat ruler, not attached to the board, with folding sights, or, more commonly, a simple three-cornered piece of wood with straight edges, the sights being taken along its upper edge.

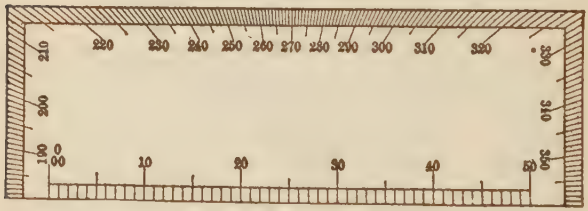
24–27. The **protractor** is an angular scale of equal parts used for plotting azimuths.

Azimuths are bearings between stations taken in the direction of progress of the reconnaissance. Bearings taken in the other direction are called **back azimuths.**

The type of protractor adopted for reconnaissance is the rectangular form. (See fig. 355.)



A face



B face

FIG. 355

It is graduated on one face, which will be called the A face, from 0° to 180°, and on the other, or B face, from 180° to 360°. The graduation is clockwise on both faces. It has a scale divided into 100 subdivisions to the foot, and a scale of inches and tenths along one edge.

The protractor may be used as a ruler, scale, triangle, and parallel ruler.

24–28. The **aneroid barometer** is an instrument used to determine the pressure of the atmosphere in inches. The pressure varies with the altitude above the sea level, and it also varies with the moisture temperature. latitude, etc.

The pocket type has a double scale on the reading face of the instrument, graduated counter-clockwise. The inner scale is marked in *inches* for recording the atmospheric pressure; the outer scale is graduated in *feet*, and approximate elevations may be read from this scale.

The barometer must be carefully handled as it is sensitive to shock. It should be carried in an inner pocket, by which means errors due to differences in temperature can to a considerable extent be eliminated.

There is a change in barometric readings due to changing atmospheric conditions. This amounts, ordinarily, to not more than 20 feet per hour.

The following table gives approximate altitudes corresponding to different pressures:

Pressure	Altitude	Pressure	Altitude	Pressure	Altitude
Inches	*Feet*	*Inches*	*Feet*	*Inches*	*Feet*
18	13,918	23	7,239	28	1,880
19	12,445	24	6,080	29	924
20	11,047	25	4,968	30	000
21	9,718	26	3,899	30.5	−451
22	8,451	27	2,871		

Section IV.—SKETCHING

24–29. The following outfit is desirable: A drawing board, paper, thumbtacks, compass, clinometer (slope board), rectangular protractor, plotting scales, lead pencil (No. 3 or 4), rubber eraser, 25-foot tape, 100 feet of twine, watch, pocketknife, canvas cover for board and paper, notebook, and field glasses.

When the cavalry sketching case is used only the extra articles not part of the sketching case need be provided.

Road Sketching

24–30. A road sketch will be long and narrow, and two or more sketches should be got on a board if possible. In this way a board of the standard size will hold a fair day's work. When a section runs off the paper mark it with a letter, as *A*, and make a note, *Continued at B*. Mark the beginning of the next section *B* and write, *Continued from A*.

Wherever else a road runs off the map, make a marginal note, "To ———, ——— miles," giving the name and distance of nearest settlement or conspicuous topographical feature. If the road crosses one parallel to the main route, write also "To crossing, ——— miles."

24–31. Traversing with oriented drawing board.—A drawing is said to be oriented when so placed that its true meridian is parallel to the true meridian on the ground. When a map is oriented with any given point vertically over the corresponding point on the ground, a ruler held on the point or station on the map, and pointed in the direction of any object, gives the azimuth of that object on the map. No angular measurements need be made. This method of determining azimuths is called the **plane table method.**

When using magnetic azimuths, making the magnetic meridians—map and ground—parallel, may be accepted as a proper orientation. A compass affords the quickest means of orienting the map.

To run a traverse by this method, assume on the map the initial point and the magnetic meridian, selecting them so that the general direction of the traverse will coincide with the longest dimension of the paper. Place the board over the first station; lay the compass on it with the north and south line parallel to the assumed meridian, and turn the board until the needle reads north. The board is then oriented, and must be in this position whenever a sight is taken. It should also be level, as nearly as can be determined by the eye.

Place a ruler on the station point of the map and sight it in the direction of any object which it is desired to plot. Draw a line along the edge of the ruler and on it lay off to the adopted scale the distance of the object if known or assumed. When all the desired azimuths have been taken from the station, sight the ruler to the second station and draw its azimuth, and then proceed to that station, pacing the distance. Arrived at the forward station, plot the paced distance, orient the board over the station, and proceed as before. If any of the objects taken at the first station can be seen from the second, new azimuths may be taken to them which will locate them by intersection, Figure 356. If no compass is at hand, orient the board arbitrarily at the first station, and at the second station orient it by placing the ruler on the line between the two, and sighting back to the station just left. Figure 357 shows the relative positions of board and ground at four successive stations.

It not infrequently happens that in the vicinity of the work there may exist known points. Bearings, either by lines of direction or by compass should

always be taken to check or correct the traverse or plan. Where three or more such points are available, the difference between their compass bearings will be the correct angles irrespective of compass error due to variation or to local attraction. These angles plotted on a piece of tracing cloth or paper from a common center and used as a protractor, fitting the lines of bearings to their respective objects, will locate the point occupied. A number of such points will check the traverse in both distance and deviation, the intermediate details being adjusted between them.

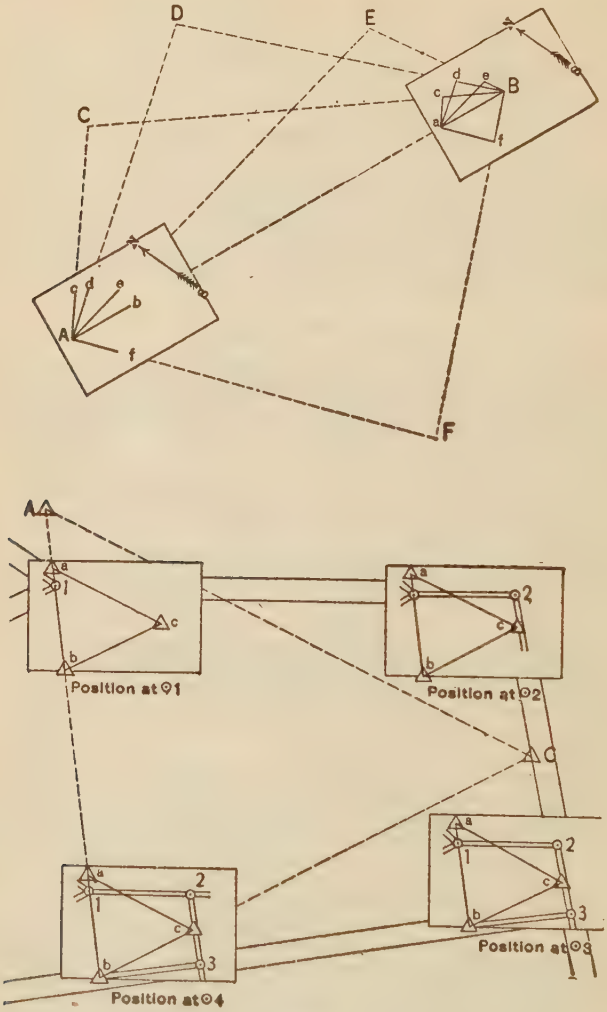


FIG. 357

24–32. Traversing with sketching case.—The same method is employed as in traversing with the drawing board or plane table (see Art. 24–31). If the traverse runs off either edge of the paper draw a meridian through the last station, roll back the paper until that station is off the board, plot the same station in a new assumed position with a new meridian through it, and continue the sketch. When the paper is cut and one position of the station placed over the other with the two meridians coinciding, the two parts of the sketch are in their true relative positions.

A good road sketch made in accordance with the foregoing principles is shown in Figure 358.

The initial station is marked 1 and is shown in the lower right-hand margin of the sketch. Other stations are shown at 2, 3, 4, etc.

24–33. Improvised instruments.—By the oriented-map method a very good sketch may be made with improvised instruments. Any smooth surface on which lines will show will answer for the board and paper. The edge of a book, an envelope, or a piece of paper carefully folded makes the ruler. A narrow strip of paper folded double several times makes a scale of equal parts.

Position Sketching

24–34. (1) A position sketch involves the mapping of an area rather than a narrow belt of country.

The size of the area depends on the purpose the sketch is to fulfill. Ordinarily, the width from flank to flank is made long enough to include the area occupied by a defending or attacking force or the area occupied by an outpost.

The depth is from 2 to 2½ miles and includes the area in front of an occupied position as well as an area in rear, if required.

It has been found that a single party of three persons (one chief of party and two sketchers) can sketch an area one-half mile by two miles in one day, and consequently this area is the largest usually assigned.

(2) As a preliminary to any position sketch a reconaissance must be made to determine the position. This line will normally be the one to be occupied by our troops. The base line (or control line) will be either a straight line or a line consisting of successive sections of straight line. The position of the controlling points marking the ends of the line (and each junction, if a broken line) are located as accurately as possible. The areas are then assigned, each consisting of approximately one-half mile along the line and 2 miles normal to the line. At junction points the areas will be triangular or wedge-shaped, and the distance along the base line will be more, or less, than the one-half mile assigned to other areas.

(3) Where the base line is established along one side of the areas, all sketches will work on one side of the line—when established along the center of the position, parties will work on both sides of the line.

(4) Prominent objects, or other details of value to aviators should be carefully located as well as areas suitable for landing places.

24–25. (1) Figure 359 shows a typical position sketch executed in accordance with military methods. The chief control officer, accompanied by the entire sketching party, starts at A', and proceeds along the control line to B' and C', and the successive areas are assigned along the control line. Sketchers, as they arrive at their successive places for starting work, leave the party and proceed with the sketching, as below indicated. Stakes are driven at A', B', and C', on which are marked their elevations by aneroid barometer, and magnetic azimuths of the dividing lines, perpendicular to the control line. The control line, so marked, determines the limits of the areas to be sketched.

(2) Sketcher No. 1 of party No. 1 leaves the party at A', and sketches along the road from A' to A, extending the sketch for 300 yards to the right and left of the road. On arriving at A he sketches toward X in a similar manner.

(3) Sketcher No. 2 of party No. 1 and sketcher No. 1 of party No. 2 leave the party at B' and proceed to sketch along the line $B'B$, extending the sketch on either side for 300 yards. When the point B is reached the sketch is cut apart on the line $B'B$, which is merely the cutting line of the sketch. It is not necessary that the sketchers follow the line $B'B$, but they should so direct the traverse as to secure, in the most convenient manner, reliable data for 300 yards on each side of the line $B'B$.

After the sketch is cut apart, each of the sketchers takes the part of the sketch pertaining to the area assigned to his party and from the point B, sketches along the outer boundary of his own area. Sketcher No. 2 of party No. 1 joins his party at X.

(4) Meanwhile the chief sketcher of party No. 1, leaving the chief control officer at B', has run a careful traverse from B' to A' and has then proceeded toward the outer extremity of his area looking for his two sketchers. Having ascertained their whereabouts he keeps in touch with them in order that there may be no delay in getting them together on the outer boundary of the area.

(5) When the party assembles at the point of X, the chief sketcher will have a plotted traverse showing the distance between the parallel lines $A'A$ and $B'B$ and the sketchers of the party will have each a sketch of a strip of topography about 300 yards wide along each edge of the area, which, when placed alongside the sketches of the adjacent areas, will accurately match as to topography, and will require no adjustment in either elevation or distance. The known portion

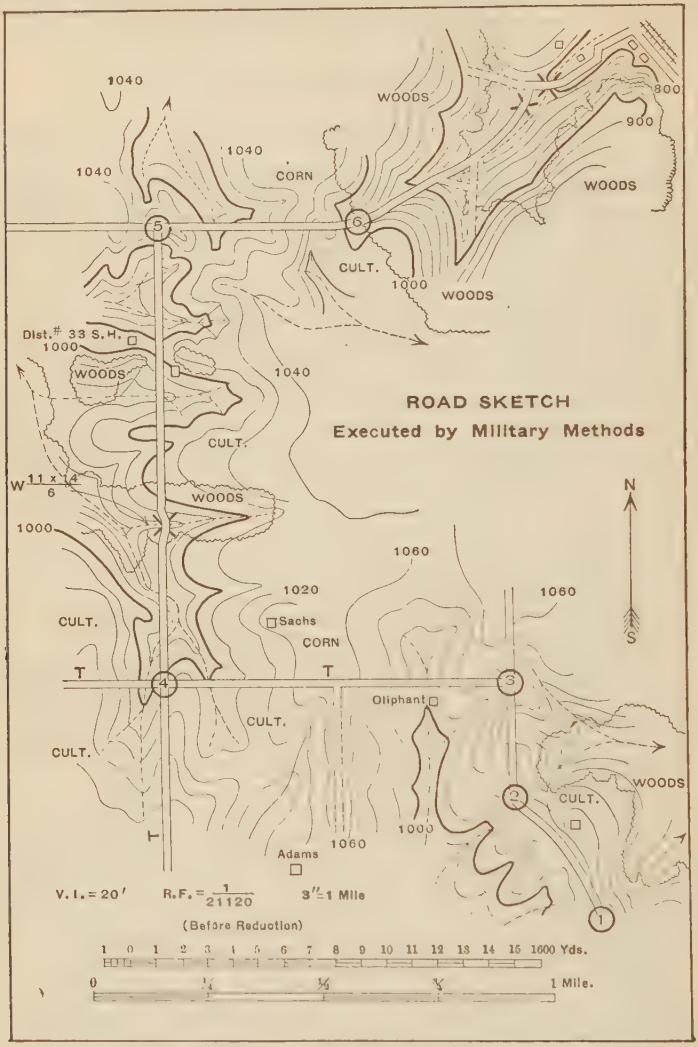


FIG. 358

of the area (first sketching party) is represented by the shaded portion in Fig. 359 The separate sketches are now placed one over the other, the distance between them being known from the traverse $B'A'$, and the azimuths of $A'A$ and $B'B$ (usually parallel) enable the sketches to be placed in their correct relative positions.

With the sketches in position, a knife cut is made clear through both sketch sheets and the blank parts are removed. The edges will fit along the line XY (the cutting line) and the sketches are secured in position with thumb tacks.

(6) The party now proceeds along the center of the area, connecting up contours and topographical features and adjusting differences. The strip will ordinarily be so narrow that little if any instrumental work will be required to fill in the interior.

(7) The other parties map their areas in a similar manner. When all have been completed, they are assembled in their proper order and pasted together along the upper and lower margins.

(8) The sketch is then traced and printed or blue prints are made from the original sketch.

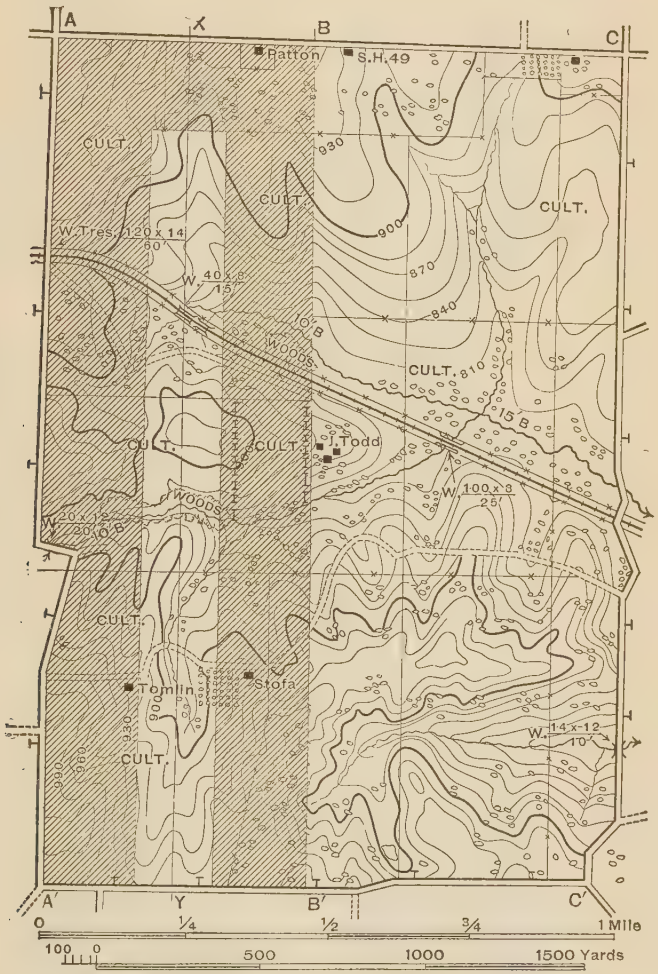


FIG. 359

Place Sketching

24–36. The method employed in making a place sketch consists in occupying certain available positions within our own lines, and locating other positions which can not be occupied by cross bearings or by bearings and estimation of distances.

A base line is established in the most practicable manner, and this line, with at least two good observing stations on the line, is plotted to scale on the map.

All important points in the area are plotted from the observing stations and the work is completed by sketching in all necessary features as accurately as possible.

Considerable skill in map making is required to make a good place sketch.

The range card for attack, described in chapter 13, Machine guns, is a type of rough place sketch.

Landscape Sketching

24–37. The sketcher takes position at a point high enough to give him a comprehensive grasp of the landscape to be sketched.

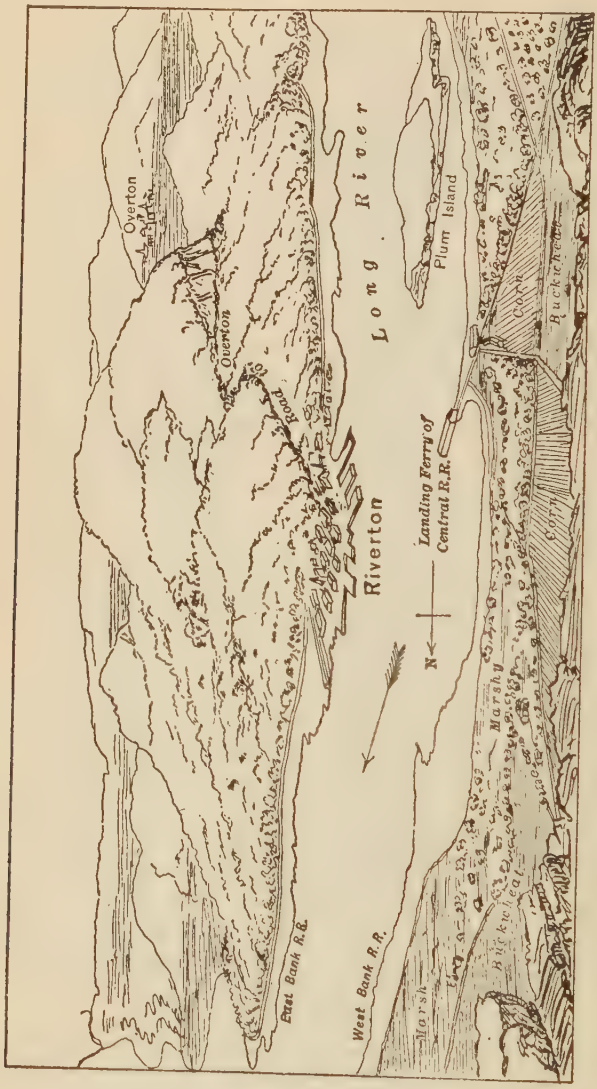


FIG. 360

Face toward the middle of the field of view. Hold the board or sketch book vertically before the eye and move it backward or forward until the sheet just fills the field. Lower the board until the sky line of the hills can be seen above its top edge, and, with a pencil, mark on the edge the points corresponding to the principal salients and reentrants of the hill forms. If desirable, the board can be moved sideways far enough to enable the principal heights and depressions

to be marked on the vertical edge. By intersecting references, the locations can then be easily established on the sheet. From these points the forms can be sketched in with much greater accuracy. Proceed next to draw the hills in outline, but faintly, with attention to the larger curves or humps at first. Go over them again with more care, bringing out the small irregularities. If any part of the horizon is visible, draw it in lightly and then complete the general mass of hills by drawing the water or base lines. Seek now for the suface character of the hills by tracing the ravine lines. The knobs and foothills are brought out by tracing the true meanders that show form. All changes in form or breaks in the ground produce corresponding breaks in the foliage of the tree masses, which show in the distance as irregular lines.

If the more important of these are sought and drawn, the general character of the hill will result. Add the foreground crest and the skeleton of the sketch is complete.

The road and railroad meanders should follow, as a rule, and the fences of the fields. Cultivated land is rendered by parallel, irregular lines. Houses, fortifications, trenches, etc., will be drawn more or less in detail according to distance and importance.

Enemies' lines of trenches, even at a great distance, should be strongly marked by simple black lines.

The indication of forests and trees is the most difficult feature.

A landscape sketch executed in accordance with the foregoing principles is shown in Figure 360.

Section V.—MAP FINISHING

24–38. With regard to map making and sketching, the following principles should be observed in their preparation:

(1) **Drawing.**—The essential requirements of a good topographical drawing are *accuracy* and *clearness*. By accuracy is meant a faithful exhibit of measurements and observations made in the field, or of data taken from other maps. Clearness involves absence of confusion or crowding, and neatness in execution. **Beauty** and **pictorial effect** are obtainable by skilled draftsmen only, and, while always desirable, are rarely necessary. Persons who are not skilled draftsmen should not attempt pictorial effect, as it will detract from accuracy and clearness without substituting any thing of equal value.

(2) **Avoid unnecessary haste** in plotting and drawing. If possible, take time to check carefully all azimuths and distances plotted and be sure they are exact. There should be no approximation on the drawing board. Although an observer may have simply guessed a distance to be 550 yards, in the absence of other information, the plotter should be careful to lay it down at exactly 550 yards.

Start with clean paper and keep it as clean as possible. Wipe off the instruments before using, especially rulers, scales, and triangles. Dust the drawing carefully before beginning work. Dust again when stopping and cover with a cloth or paper. If necessary, dust the drawing and wash the hands occasionally while at work.

(3) **Make all ink lines firm and very black.**—A drawing to be made in ink is usually drawn first in pencil, and in such cases a very hard pencil (4H or 6H) is best. If the pencil drawing is to be traced, a softer and blacker pencil should be used, but must be kept well pointed.

24–39. Titles, notes, etc.—Every finished drawing should have descriptive title, consisting of—

(1) The designation of the organization under whose auspices it is made.

(2) Its kind, as **map, sketch, plot, plan, profile, section,** or **elevation.** If more than one kind of drawing appears on the sheet, each should be mentioned in the title.

(3) Its subject, if it relates to a particular object, feature, or purpose.

(4) Its locality. This and the preceding may be interchanged in position.

(5) Its sources, as **compiled from, etc.; reduced from, etc.; from a survey, etc.**

(6) Its authorship. If the work has been done by one person, acting under the instruction of another, both should be named.

(7) Its date.

(8) Its linear scale; its contour interval; and it may also have a scale of map distances.

24–40. (1) **Notes.**—Besides the title, such information as will help to a proper understanding of the meaning and value of the map should be given in the form of notes. These usually relate to methods used in the survey, datum points, etc.

(2) **Meridian.**—The magnetic meridian should be shown, and the true meridian also if the declination is known. The true meridian may be a line, of 3 inches or upward in length, with a star at its north and the feather of the arrow at its south end. The magnetic meridian may be an arrow crossing the former at the middle point and making with it an angle equivalent to the declination.

(3) **Border.**—The drawing should be inclosed in a rectangle, preferably with its sides N. and S. and E. and W. The border consists of two parallel lines, the inner one medium fine, the outer one medium heavy, with a space between them equal to the width of the outer. For geographical maps a double border is used, with space between sufficient to contain the numbers of meridians and parallels

Section VI.—RECONNAISSANCE DATA

24–41. A road reconnaissance should procure data on the following subjects:

Reconnaissance of a Road

The roads.—Gradients (slopes), especially the steepest; width of roadway; if paved, width, kind, and condition of paving; width and depth of side ditches, and whether wet or dry; if not paved, character of soil, sand, clay, or gravel; kind of fences and width between them. The sketch should also show where the road is in embankment or cutting; where wagons can not double or pass, and where foot troops can not march along the side between the wagon track and the fences.

Bridges.—Material of piers and abutments; type and material of superstructure, as girder, truss, arch, suspension, wood, steel, stone, etc.; width of roadway, clear headroom; safe load. Of bridges over the road clear width and height; over streams, the nearest bridges above and below and whatever information can be obtained about them.

The country.—Character of cultivation or natural vegetation; areas and density of timber, underbrush, vines, especially poisonous ones; marshes and fords; kinds of fences; nature of soil; general configuration of surface, especially high hills, long ridges or valleys, bluffs or slopes too steep to scale, and practicable routes to their crests.

Streams crossed.—Name, width, depth, and surface velocity in swiftest current; velocity noted as sluggish, moderate, quick, or swift; elevation of high-water marks in relation to the road; which bank is the higher at crossing and above and below, and how much; accessibility of water for stock; fords at or near crossing; length, depth, and steepness of approaches; levees or embankments, height, and thickness on top; if navigable, to what distance above and below and for what class of vessels—steamers, flatboats, rowboats.

Towns and villages passed through.—Name, location on map, and population. Names of streets to be traversed. Material, as stone, brick frame, log; size, 1, 2, 3 stories, and distribution, close or scattered, of the houses in those streets; gradients of intersecting streets; location of railway depots, post, telegraph, and telephone offices; of drinking fountains and watering troughs; of elevators, storehouses, or other accumulations of food or forage; of blacksmith, wagon, and machine shops.

When ordered to make a complete examination of a town or village, note besides the foregoing, location and size of principal buildings, halls, court and school houses, churches, banks, jails, and their ownership; sources, maximum quantity and distribution of water supply; sanitary conditions and disposal of wastes; location of railroads, depots, freight houses, sidings, etc.; for all roads entering from the surrounding country the same information as scheduled above for streets; location and extent of open spaces, and of large substantial buildings standing apart; location and extent of high ground within range, especially that from which streets can be enfiladed.

Railroads crossed.—Name, gauge, single or double track, sidings and loading platforms at point of crossing; crossing at grade, over or under; distance and name of nearest station each way; direction and distance of nearest roundhouse, shops, etc.

Reconnaissance of a River

24–42. River reconnaissance.—Designate the banks as right or left, the right bank being that on the right hand when looking down the stream. If, when standing on the bank facing across the stream, the current flows from left to right, the observer is on the right bank; if from right to left, he is on the left bank.

If the stream is navigated, pilots and residents will know distances by channel between landings with sufficient accuracy for the purposes of a field reconnaissance. In making a traverse along the banks of the river, it may be desirable to cross from one side to the other to save distance or avoid obstacles. When a crossing is to be made at two or three stations from the point of crossing select a point on the other side and take an azimuth to it. From the last station take another azimuth to the selected point, locating it by intersection. If the conditions prevent an intersection, take an azimuth from the last station to the point on the opposite bank and estimate the distance.

The valley.—General configuration, heights of limiting ranges, and positions of passes or roads crossing them, commanding ground from which a stretch of the channel of considerable length can be enfiladed by artillery; forest growth on or near banks; soil and cultivation of the valley; roads parallel to river, and means of access to them from the river.

The stream.—Its width, depth, and velocity; navigability, as for steamboats, flatboats, rowboats, rafts, and head of navigation for each; nature of obstructions to navigation and possibility of removing or avoiding them; season of high and low water; average rise and fall; rapidity of rise and fall and causes; amount of drift; character of banks and relative command. Quality of water; amount and kind of sediment borne; usual period and thickness of ice.

Tributaries and canals.—Width, depth, navigability, and means of crossing. Nature and purpose of canals; dimensions and lifts of locks; time for lockages; means of destroying locks and effect of destruction; floating plant found.

Bridges and fords.—As in road report. Also for bridges note position of the channel and navigable width between piers; height of arches and lower chords above the water at different stages; dimensions and operation of draw spans. Note the exact position of fords and the marks on both banks by which they may be found; length, width, and nature of bottom; velocity of current; position of deep holes; aids to crossing. Fords should not be more than 4 ft. 4 ins. for cavalry, 3½ ft. for infantry, and 2 ft. 4 in. for guns and

ammunition. Note nature of approaches to bridges and fords; width of roadway, slopes, soil, effect of weather and traffic. Note especially the defensibility of bridges and fords.

Ferries, boats, and other means of crossing.—Position of ferries; approaches and practicability for horses and loaded wagons; sizes, number, and kinds of boats; method of propulsion; sites for military bridges or ferries; character of site for construction, use, and defense; proximity of islands and tributary streams; approaches and slope of banks; width of river and maximum surface velocity of current; materials for the construction or repair of boats, bridges, or ferries.

Inundations.—Places suitable for inundations by damming or obstructing a narrow bridge span, or by cutting a levee or dike. Note raised roads on ground liable to natural or artificial inundations and the safest route to follow by known landmarks when the road is overflowed. An extensive inundation 2 ft. deep on level ground is a serious obstacle unless the roads are very sound and marked by trees, posts, etc. Even when so marked a dip in the roadbed of 3 or 4 ft. may render the road impassable. A railroad bed is soon washed out even by a slight overflow.

Reconnaissance of a Railroad

24-43. Reconnaissance of a railroad—The line.—Local name; terminal points and distances between stations and other points; gauge; single or double track; condition of roadbed, ties, and rails; drainage and liability to overflows or washouts; facilities for repair; condition of right of way for marching troops along the line.

Tunnels and bridges.—Number and location; dimensions; strength of bridges; means of destroying and repairing; of blocking traffic.

Rolling stock.—Number and nature of engines and cars available; capacity for transporting troops between given points; facilities for constructing armored trains, as spare rails, old boilers, etc.; location and capacity of shops and store yards.

Stations.—Name and location; facilities for entraining and detraining troops with wagons and horses; platforms on through line and sidings; ramps; side tracks, number and capacity; turntables; water tanks; fuel supply; storage facilities; derricks or cranes; crossovers for teams and pedestrians. Facilities at hand for hospitals, camps, depots; for feeding men, heating coffee, watering horses during temporary halts.

Other communications.—Telegraph lines; number and location of stations; number of wires; connections; parallel highways, roads, rivers, or canals ;means of access from same to railroad; junctions and crossings of other lines; relative elevation; facilities for laying temporary switches and sidings at stations or between crossing lines.

Defensibility.—Heights commanding line of road; defense of stations; defense of road and telegraph lines against raiding parties; structures exposed to demolition; defense and attack of same; defiles and river crossings.

Reconnaissance of a Wood

24-44. Reconnaissance of a wood or forest.—Note all roads and paths, and all hills, ravines, and streams within the wood or skirting the edges; kinds of trees, density and growth; underbrush, prevalence of poisonous shrubs and vines; marshy or large open spaces; practicability of forming new roads by cutting; creation of obstacles by felling trees; if there are no roads traverse the shortest practicable path between the point of entrance and point of exit, and mark boulders or blaze trees, set stakes, or otherwise indicate this path, and also give compass bearings of the route to be followed. Note the exterior forms of the woods, whether parts of the edge flank other parts; connection with neighboring pieces of wood by scattered trees or clearings; undulations of the ground that would give cover to attacking force or to defenders.

Reconnaissance of Mountains

24-45. Reconnaissance of mountains.—Note the number and positions of passes through the mountains of roads and trails leading to these passes, their condition, practicability and means of repair; steepness of slopes on the sides of roads; means of constructing additional roads; watercourses and their direction, nature, and time of floods; means of crossing. Note ravines and open glades on mountain sides, lookout points and good signal stations; note time and duration of snowdrifts on roads or passes; depth of drifts and possibility of removing them or of traveling on the surface of the snow. Note extent and nature of forest growth.

Reconnaissance of a Position

24-46. Reconnaissance of a position.—This problem usually includes the selection of the position, and is therefore tactical as well as topographical. Certain relations and conditions must be observed in the selection, and the extent and degree in which they are found must be clearly shown on the map or in the report.

The length of the position, or its development along the firing line, should be proportional to the force available for its occupation. Exact rules can not be given, but 5,000 infantry per mile or 3 men per yard is the usual estimate.

The flanks must be secure.—Impassable natural features, a river, mountain, or stream form the best flank. Lacking these, a wood, a deep ravine, a cliff, or a high hill will serve. Even with these features absent a flank may be strengthened by the construction of a strong earthwork, but the general rule obtains that natural weakness of the flanks must be made up by a greater number of men, or by the substitution of cavalry for infantry in case the ground favors the movements of mounted troops.

If the flanks are naturally strong the line should be withdrawn to make the entire position reentrant. If the flanks are naturally weak, the connecting line should be held straight or advanced so as to make the position straight or salient.

Reconnaissance for a Camp

24-47. Reconnaissance or a camp or winter quarters—Site.—Location, elevation, and area; sanitary features, such as drainage, dryness, and general character of top soil; proximity of swampy ground or stagnant ponds.

Communications.—Sufficiency of existing roads and paths, maximum grades, probable condition under heavy traffic and in bad weather, location and kind of materials available for improvement or repair, railroad or water communication and terminal facilities of same.

Water and fuel.—Location, kind, and quantity of fuel at hand; quality and quantity of water; facilities for filling water carts, for watering animals, and for washing and bathing; nature of supply, as wells, springs, running streams, and its reliability.

Shelter and conveniences.—Proximity of trees, brush, wood, hay, and straw for huts and bedding; of markets; of towns and villages.

Defensibility.—Location of outposts and guards; location and character of defensive positions in or near the camp; force required to hold positions which may command the camp.

Chapter 25

BUGLE CALLS AND SIGNALS

MANUAL OF THE BUGLE

Warning Calls

25–1. **First call, guard mounting, full dress,** and **drill call,** precede the **assembly** by such interval as may be prescribed by the commanding officer.

Mess, church, and **fatigue,** classed as service calls, may also be used as warning calls.

First call is the first signal for formation for roll call and for all ceremonies except guard mounting.

Guard mounting is the first signal for guard mounting.

The field music assembles at **first call** and **guard mounting.**

Formation Calls

25–2. **Assembly:** The signal for companies or details to fall in.

Adjutant's call: The signal for companies to form battalion; also for the guard details to form for guard mounting on the camp or garrison parade ground; it follows the **assembly** at such interval as may be prescribed by the commanding officer.

It is also used as a signal for the battalions to form regiment, following the first **adjutant's call** at such interval as the commanding officer may prescribe.

To the color: Is sounded when the color salutes.

Alarm Calls

25–3. **Fire call:** The signal for the men to fall in, without arms, to extinguish fire.

To arms: The signal for the men to fall in, under arms, on their company parade grounds as quickly as possible.

Service Calls

25–4. **Tattoo, taps, mess, sick, church, recall, issue (provision call), officers', company commanders', chief petty officers', fatigue, school,** and **the general.**

The general is the signal for striking tents and loading wagons preparatory to marching.

Reveille precedes the **assembly** for roll call.

Taps is the signal for extinguishing lights; it is usually preceded by **call to quarters** by such interval as prescribed.

Assembly, reveille, retreat, adjutant's call, to the color, the **flourishes, ruffles,** and the **marches** are sounded by all the field music united; the other calls, as a rule, are sounded by the musician of the guard or orderly musician; he may also sound the **assembly** when the musicians are not united.

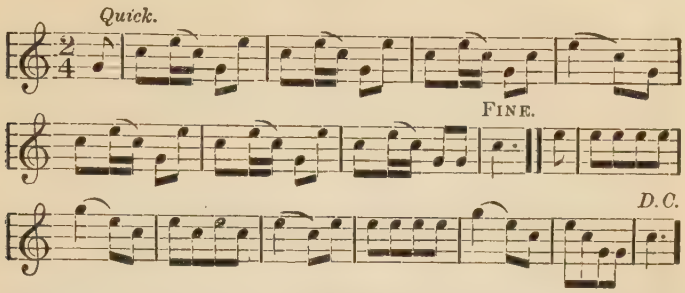
The morning gun is fired at the first note of reveille, or, if marches be played before **reveille,** it is fired at the commencement of the first march.

The evening gun is fired at the last note of **retreat.**

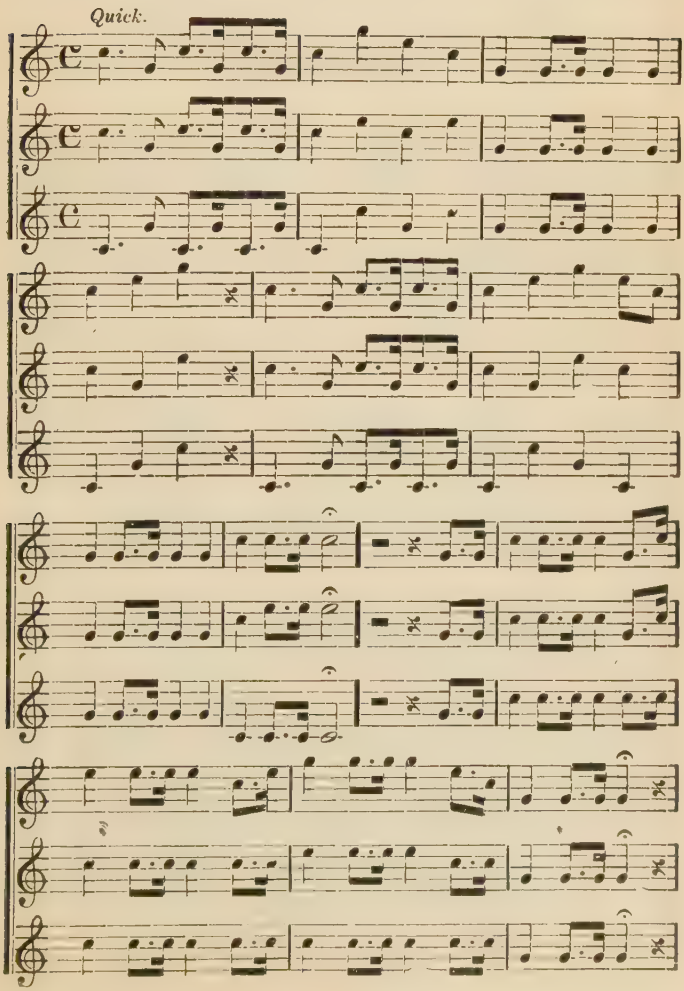
BUGLE CALLS

The number in parenthesis after the name of each call refers to the number of the call in Ship and Gunnery Drills, U. S. N.

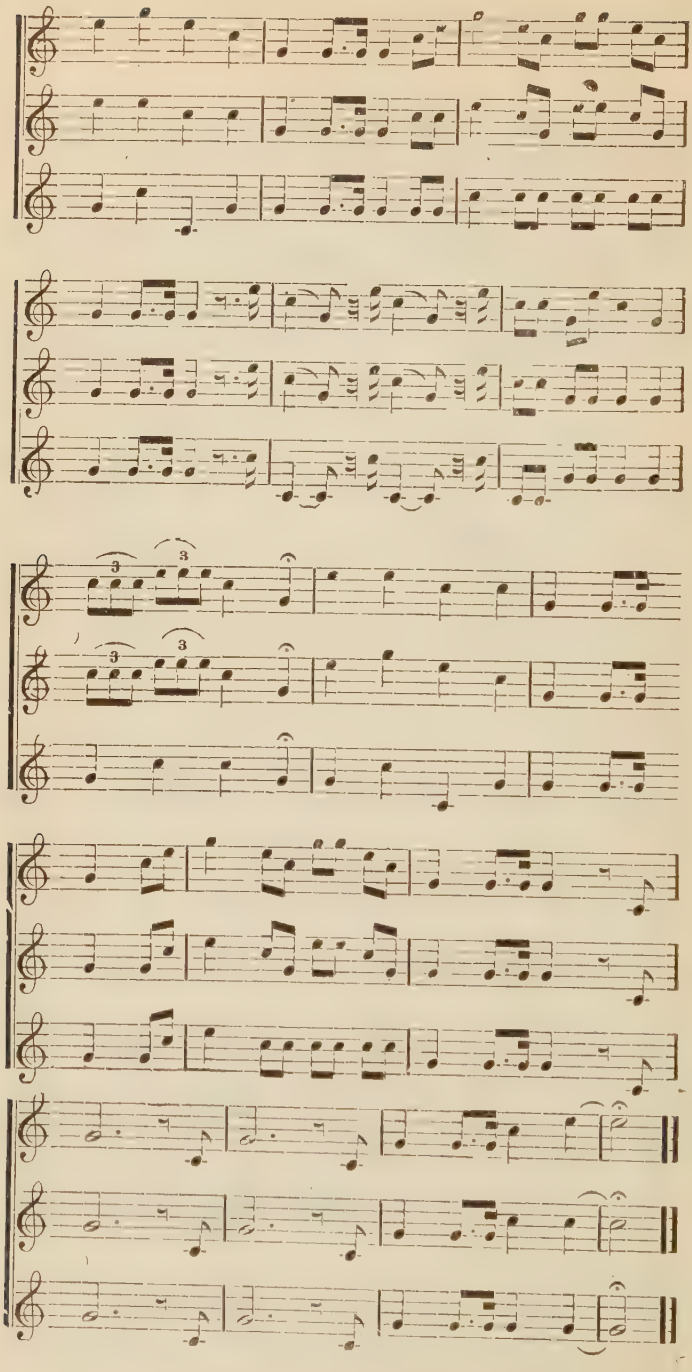
1. Reveille (1)



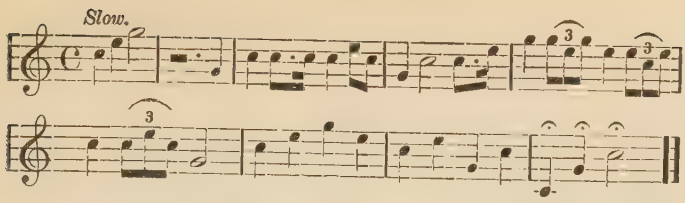
2. Tattoo (2)



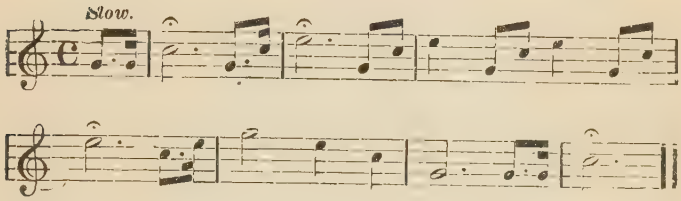
2. Tattoo (2)—Concluded



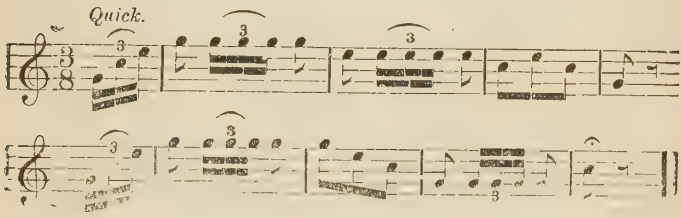
3. Call to Quarters (63)



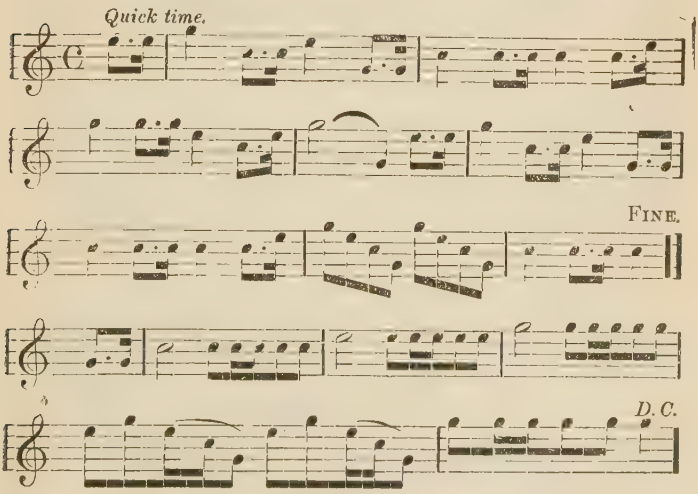
4. Taps (3)



5. First Call (4)

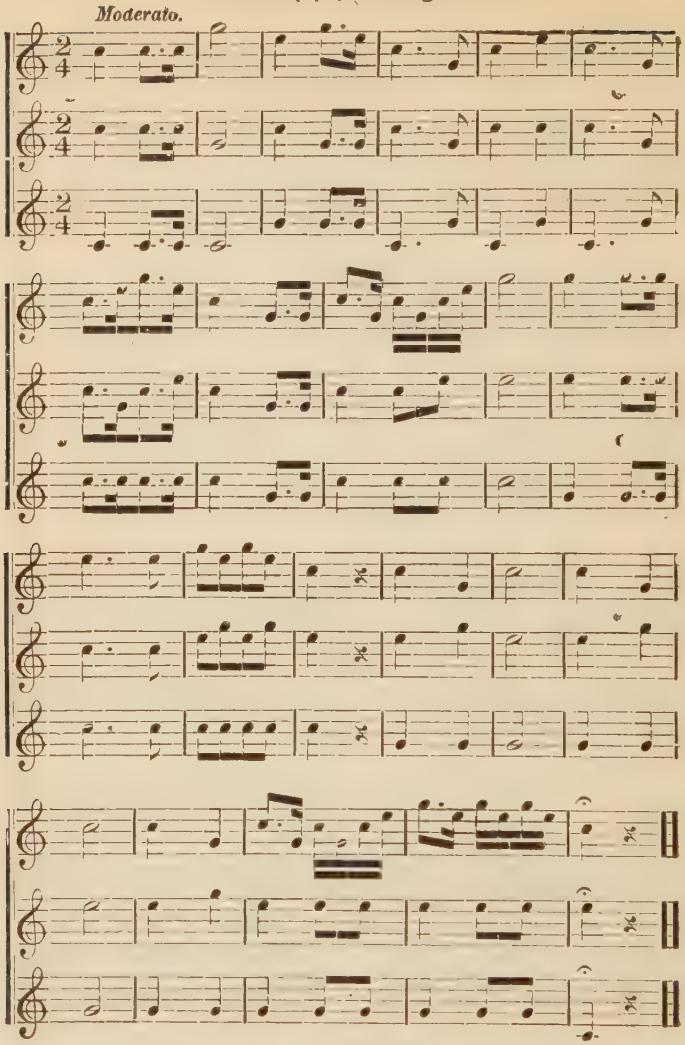


6. To the Color (5) (Morning Colors)



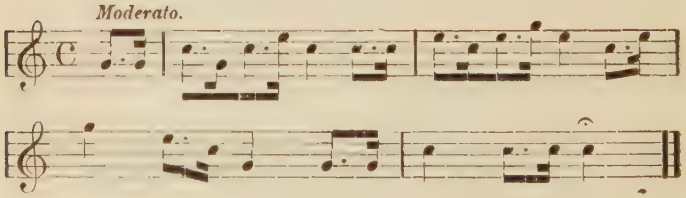
7. Retreat (6) (Evening Colors)

Moderato.

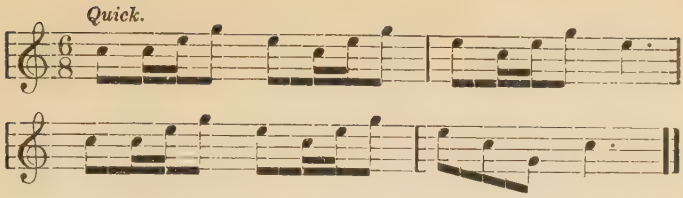


8. Assembly (8)

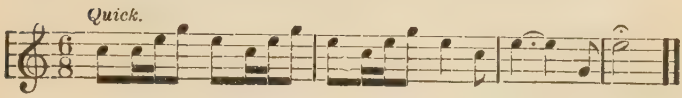
Moderato.



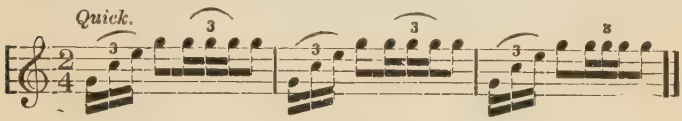
9. Officers' Call (7)



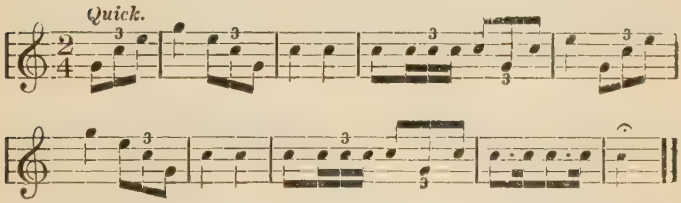
10. Company Commanders' Call (62)



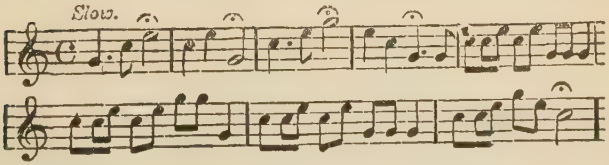
11. Chief Petty Officers' Call (15). (Ship Call—Full Guard Fall in on the Quarter Deck)



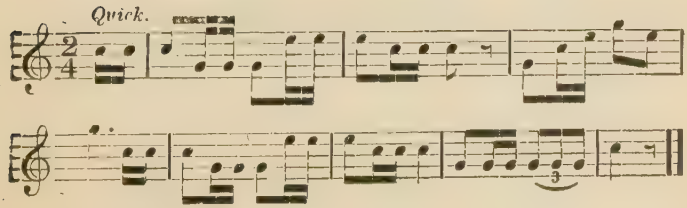
12. Sick Call (13)



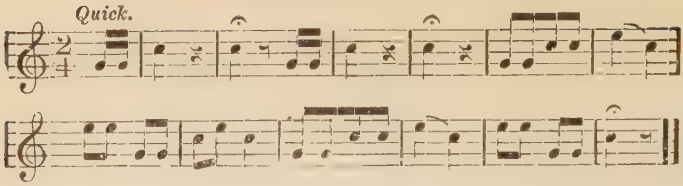
13. Church Call (34)



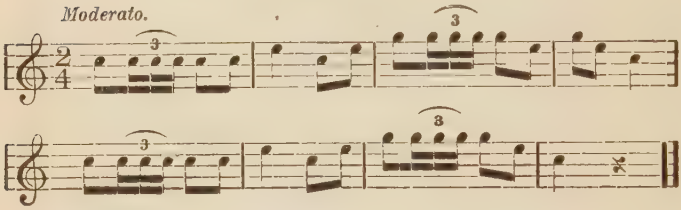
14. Drill Call (9)



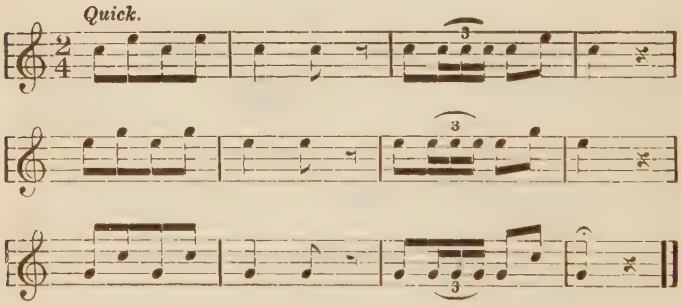
15. School Call (39)



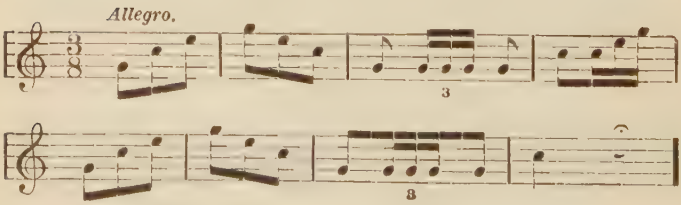
16. Recall (11)



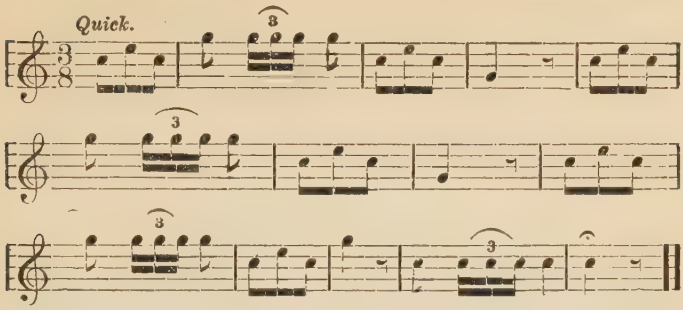
17. Mess Gear (17)



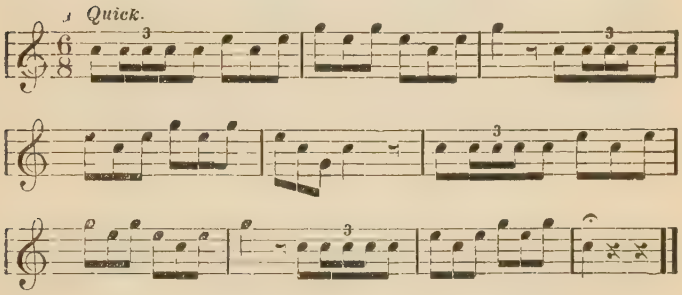
18. Issue (Provisions) (18)



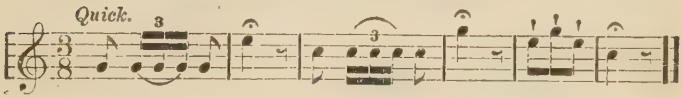
19. Fatigue (37) (Ship Call—Extra-Duty Men Fall in)



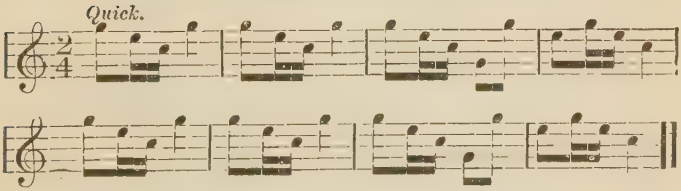
20. Guard Mounting (61)



21 Full Dress (64) (Ship Call—General Muster)

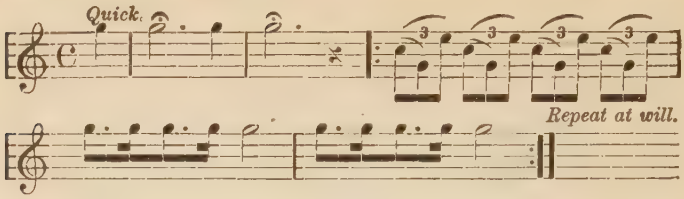


22. Adjutant's Call (66)

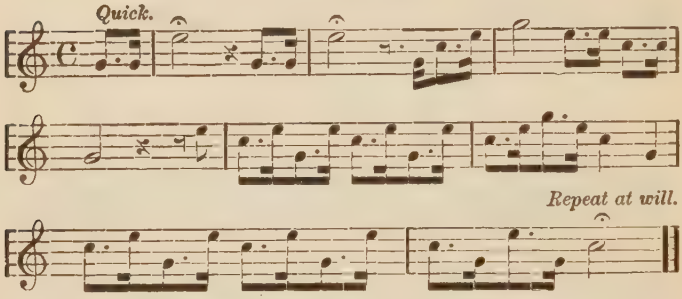


23. Flourishes for Review (35)

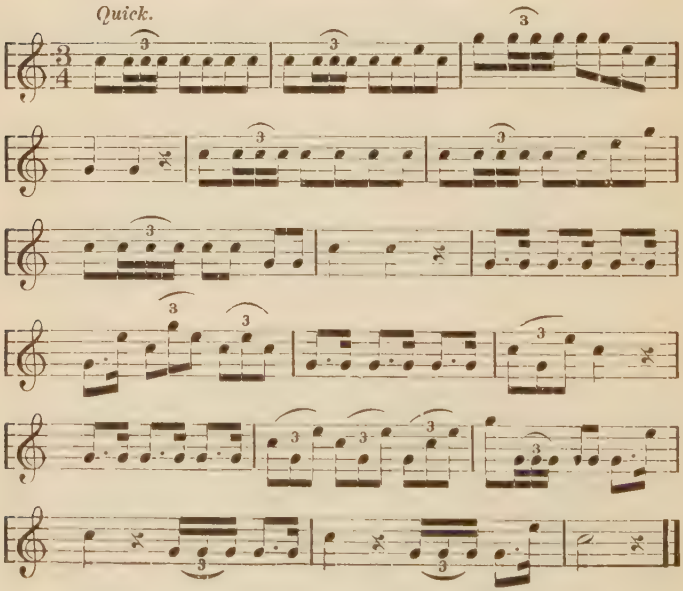
24. To Arms (28). (Ship Call—Torpedo-Defense Quarters



25. Fire Call (31)

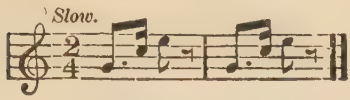


26. The General (65)

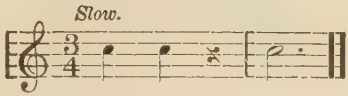


27. Assemble, March. Same as Assembly, No. 8
28. Attention (67)

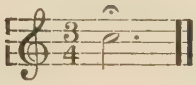
29. Attention to Orders (none)



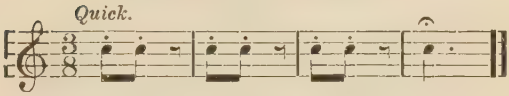
30. Forward, March (68). Also, quick time, if marching in double time



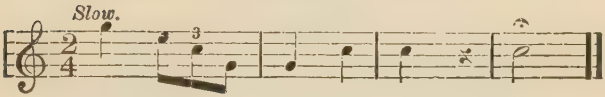
31. Halt (69)



32. Double Time, March (71)

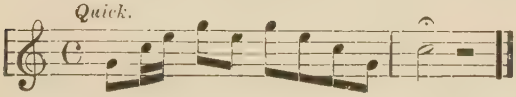


33. To the Rear, March (95)

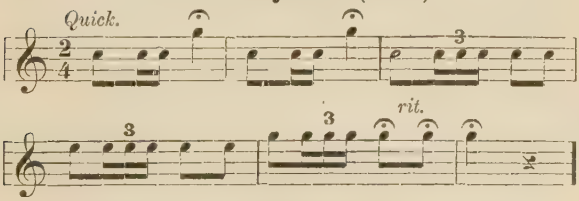


34. Commence Firing (92)

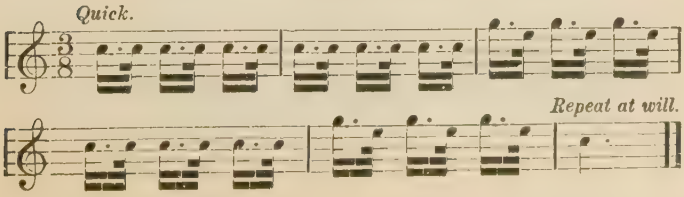
35. Cease Firing (93)



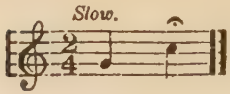
36. Fix Bayonets (none)



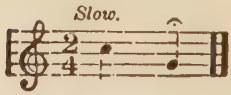
37. Charge (72). (Ship Call—Man Overboard)



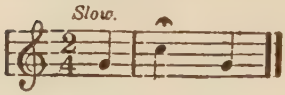
38. Guide Right (73)



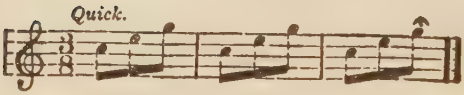
39. Guide Left (74)



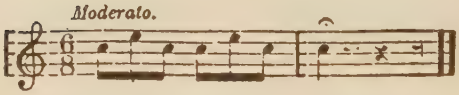
40. Guide Center (75)



41. Companies (76)

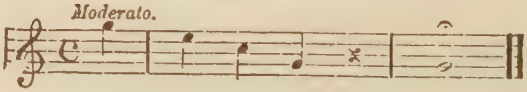


42. Battalions (77)

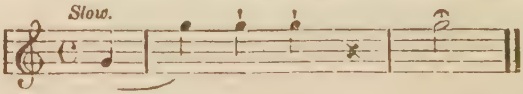


43. Squads Right, or By the Right Flank. (In Artillery, Sections Right Turn.) March (78)

44. Squads Left, or By the Left Flank. (In Artillery, Sections Left Turn.) March (79)



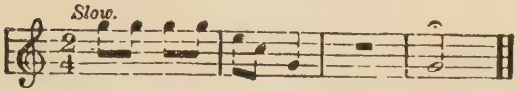
45. Squads (in Artillery, Sections) Right About. March (80)



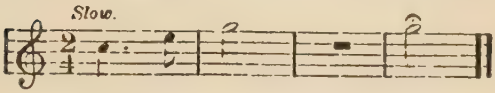
46. Squads (in Artillery, Sections) Left About. March (81)

47. Column Right. March (82)

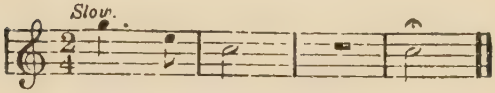
48. Column Left. March (83)



49. Right Oblique. March (84)

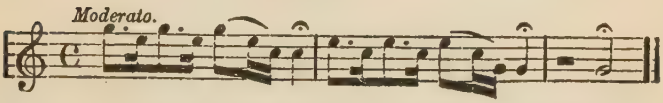


50. Left Oblique. March (85)

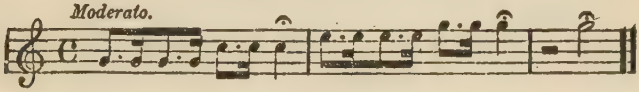


51. Right Front into Line. March (86)

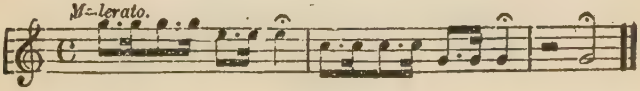
52. Left Front into Line. March (87)



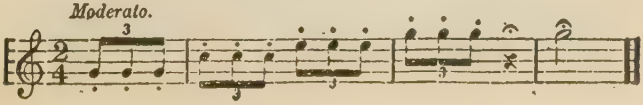
53. On Right into Line. March (88). (Ship Call—Man Torpedo Defense Battery)



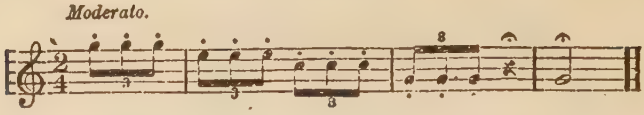
54. On Left into Line. March (89). (Ship Call—Torpedo-Defense Battery in Reserve)



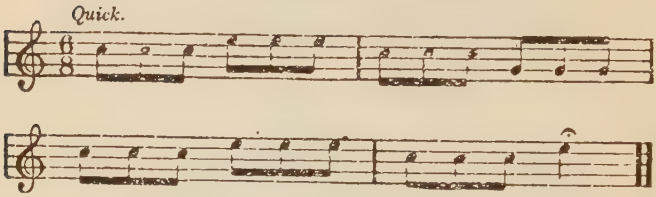
55. Company (or Companies) Right. March (90). (In Artillery, Platoons Right Turn)



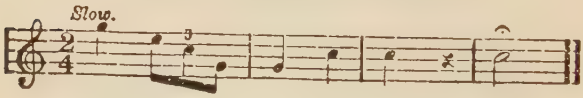
56. Company (or Companies) Left. March (91). (In Artillery, Platoons Left Turn)



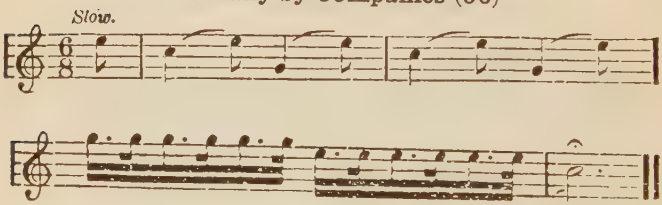
57. As Skirmishers. March (94)



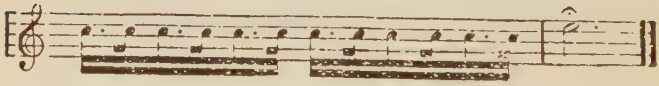
58. To the Rear. March (95)



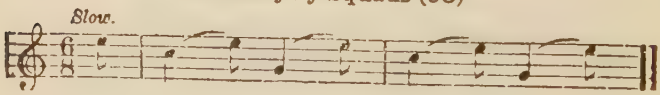
59. Rally by Companies (96)



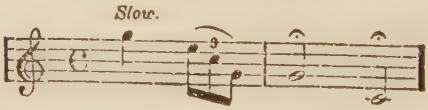
60. Rally by Sections (97)



61. Rally by Squads (98)



62. Face to the Rear (99)

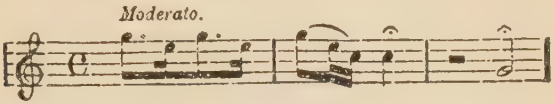


63. In Battery (100)

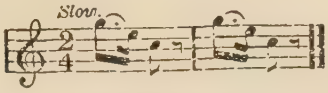
64. From the Right, Front into Echelon (101)

65. From the Left, Front into Echelon (102)

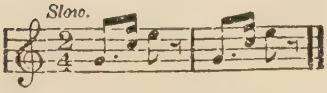
Note.—From the right (or left) rear into echelon are the same calls as 101 and 102, respectively, followed by FACE TO THE REAR (99).



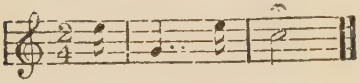
66. Lie Down (103)



67. Rise (104)

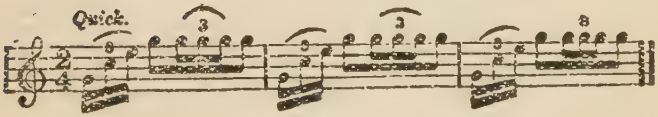


68. Route Step. March (105)

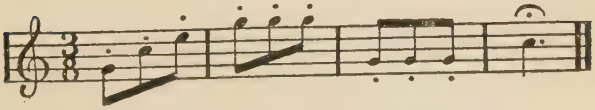


69. Band Call (14)

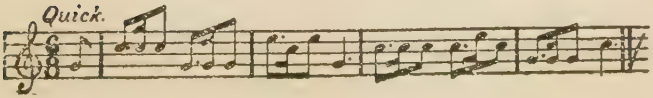
70. Full Guard (15)



71. Carry on (19)



72. Dismiss (Retreat from Drill) (12)



Part III

COMBAT PRINCIPLES—UNITED STATES ARMY

[Part III has been reprinted from the United States Army Training Regulations except that, as far as practicable, the Army designations of rank have been converted to those of corresponding rank and rating in the United States Navy. No changes have been made in any of the illustrations. In the case of TR 420–180, Combat Principles—The Service Company Infantry Regiment, the Navy has no organization corresponding to the Army transportation service, so that in the event of an extensive campaign which would necessitate the Navy's commandeering animal transportation, the ratings of wagonmaster, stableman, etc., would have to be filled by volunteers who from previous experience would be best qualified to fill them.]

TR 420–100. Development of Offensive Combat.

TR 420–105. Combat Principles—The Rifle Squad.

TR 420–110. Combat Principles—The Rifle Section.

TR 420–115. Combat Principles—The Rifle Platoon.

TR 420–120. Combat Principles—The Rifle Company.

TR 420–125. Combat Principles—The Machine-gun Section.

TR 420–130. Combat Principles—The Machine-gun Platoon.

TR 420–135. Combat Principles—The Machine-gun Company.

TR 420–160. Combat Principles—The Infantry Battalion.

TR 420–170. Combat Principles—The Infantry Regiment.

TR 420–180. Combat Principles—The Service Company, Infantry Regiment.

TR 420–185. Combat Principles—The Infantry Brigade.

TRAINING REGULATIONS, NO. 420-100

INFANTRY

Development of Offensive Combat

	Paragraph
Steps of the offensive	1
The advance in route column and development	2
The approach march and deployment	3
Advancing the attack	4
The assault	5
Continuing the attack, passage of lines, and reorganization	6
Pursuit	7
Organization of the ground	8

1. Steps of the offensive.—*a.* In offensive combat, all infantry units pass through certain successive steps. These steps in their usual order of sequence are (see pl. 1)—

(1) The advance in route column and development (reconnaissance).
(2) The approach march and deployment.
(3) Advancing the attack (fire and movement).
(4) The assault.
(5) Continuing the attack, passage of lines, and reorganization.
(6) Pursuit or organization of the ground.

b. In most cases, the enemy will occupy several positions, one behind the other, instead of a single position as shown in Plate 1. In such cases, instead of overcoming a single hostile position, it will usually be necessary to penetrate the hostile zone and overcome several successive hostile positions. (See pl. 2.)

c. In some cases, the advance to the enemy's first position will be made under the cover of a moving curtain of artillery fire, called a rolling barrage. In such a case infantry units may often advance to the enemy's first position without going through the step called advancing the attack. (See pl. 3.)

2. The advance in route column and development.—*a.* Infantry units begin an offensive by advancing toward the enemy in column of squads or some other close-order formation suitable for marching. This is called the advance in route column.

b. The object of this advance in route column is to place the different units in preparatory positions from which they can be readily moved to their allotted tasks.

c. The troops are kept in column of squads (or similar formation) as long as it is safe to do so, because this formation is best not only for marching but also for facility of control by the leaders.

d. However, during the advance in route column, large bodies of troops are not kept in a single column because it takes a long time for a large body of troops to get into battle formation. Therefore, as they draw near the enemy the large units are broken up into separate columns which march parallel to each other, each column keeping in touch with adjacent columns. This breaking up of a column into separate columns usually takes place gradually. This is called development. Brigades break up into separate regimental columns and regiments break up into battalion columns and so on through the smaller units, each remaining in column of route until it becomes necessary to take up an extended-order formation. (See pl. 4.)

e. Troops in close-order formation may suffer heavy losses in a short time if subjected to hostile fire as they present a large concentrated target. Therefore, while advancing in route column, each separate column sends out one or more covering detachments to obtain information of the enemy and to give timely warning so that units in close order can change their formation before coming under hostile fire. The work performed by these covering detachments is called reconnaissance and security.

f. By means of reconnaissance, the enemy's position, the location of his flanks, the character of the terrain, and the nature of the hostile field works are determined so that commanders can act intelligently. Cavalry and air-

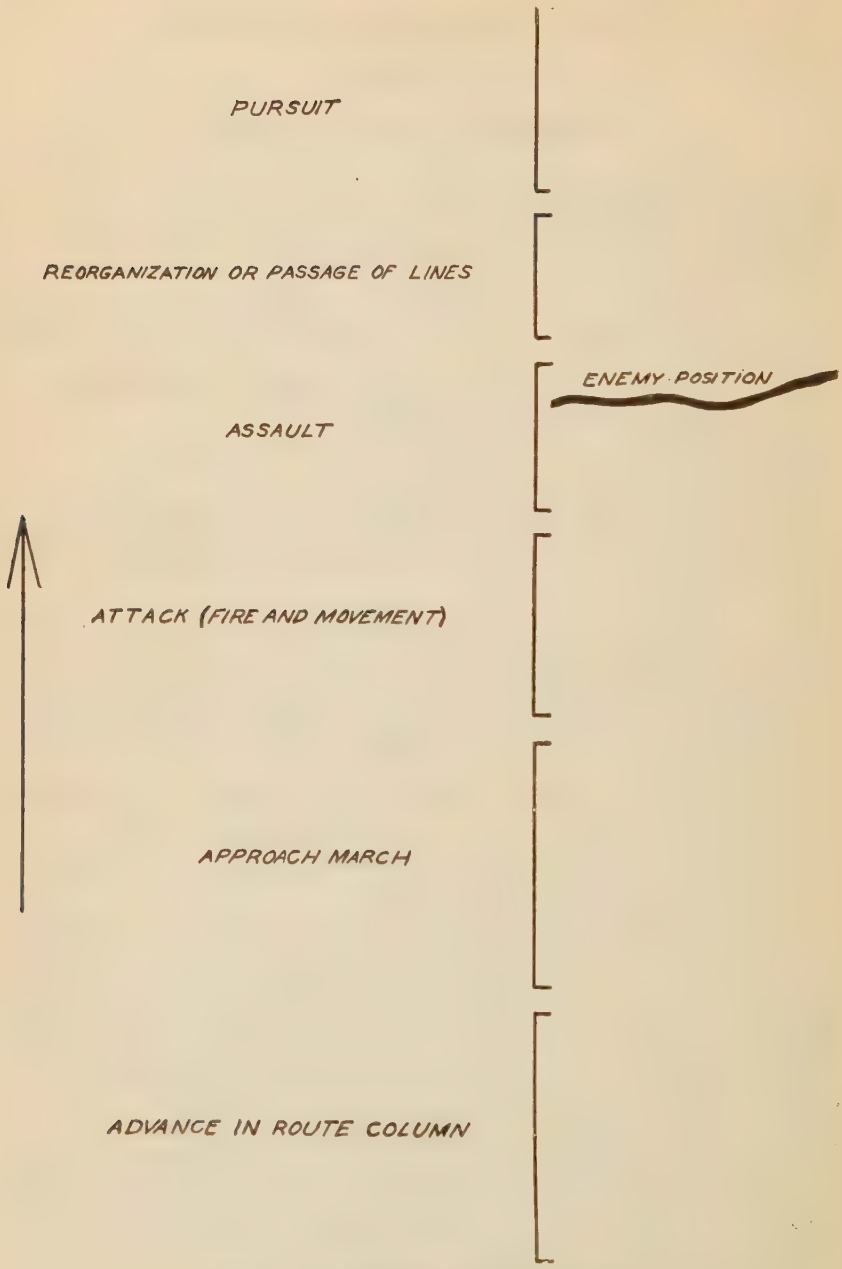


PLATE 1.—The successive steps of an offensive

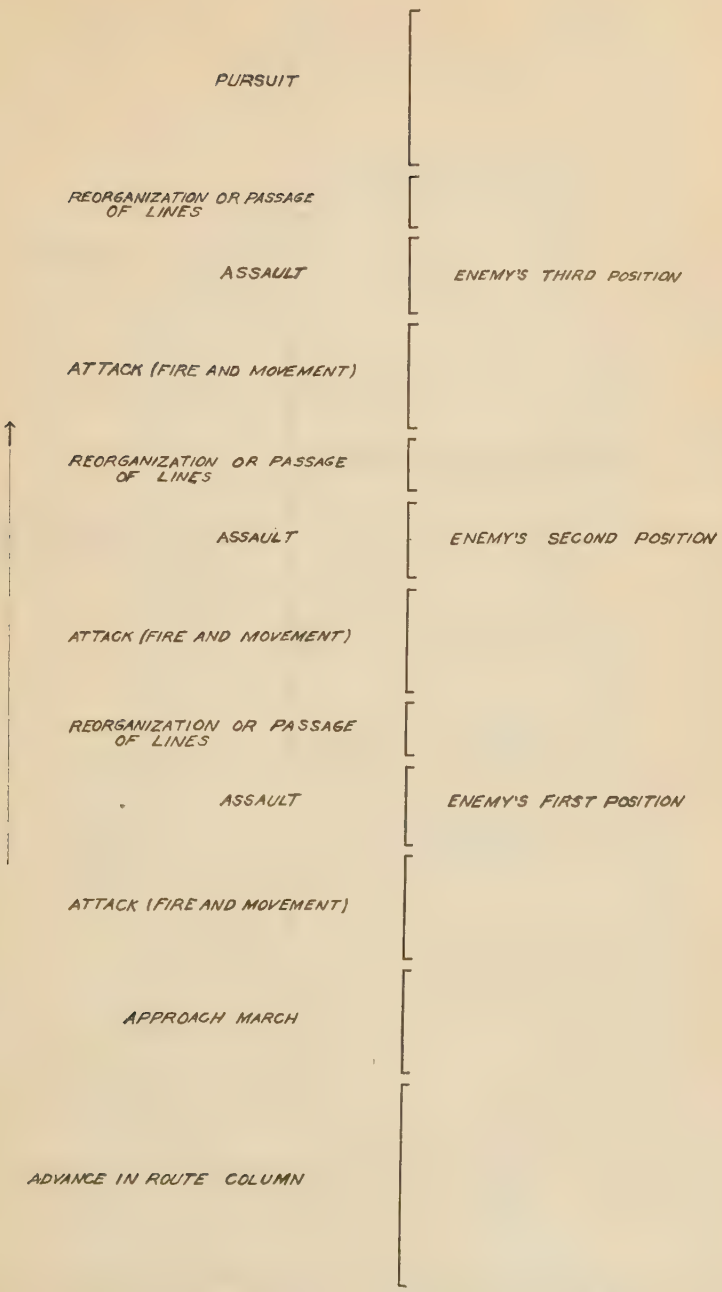


Plate 2.—The steps of the offensive when the enemy occupies several successive positions

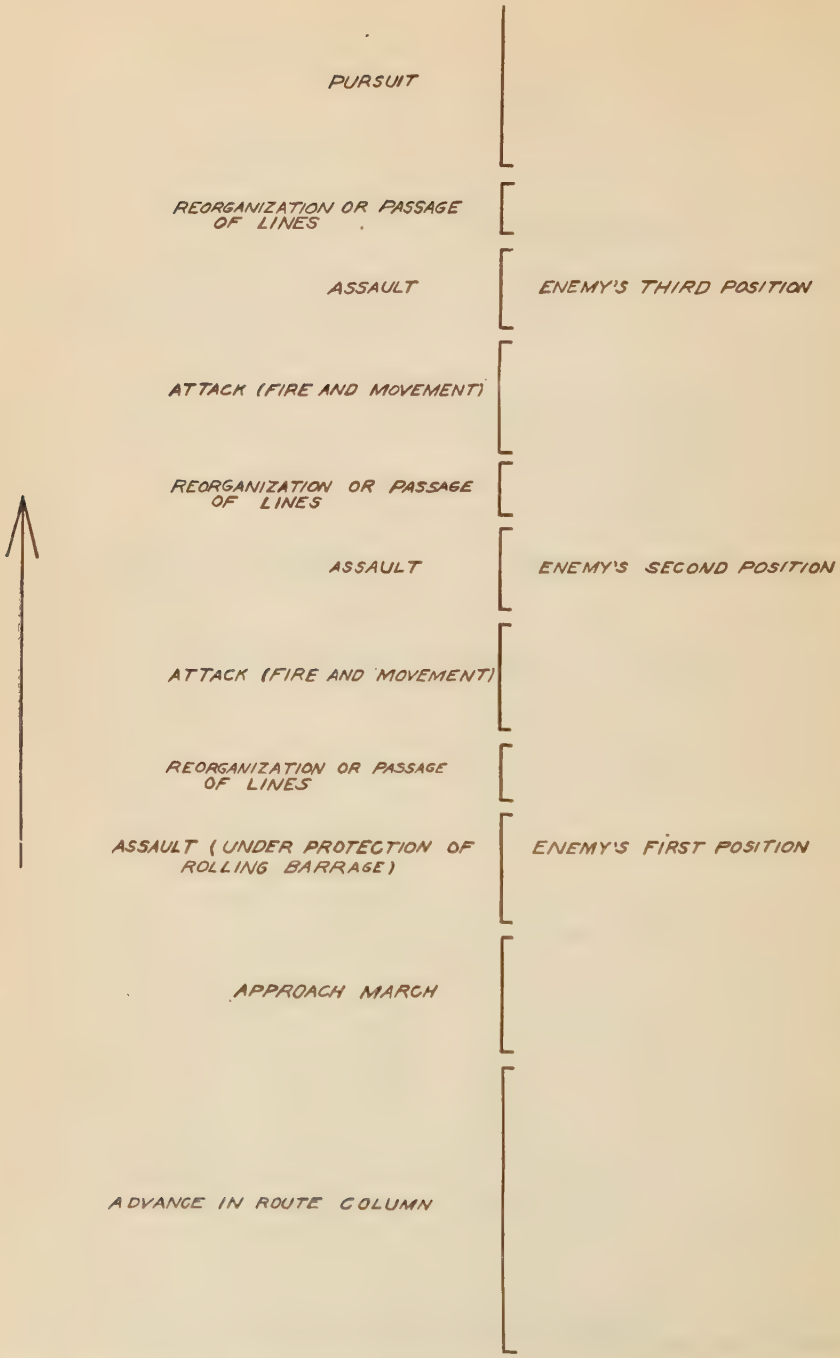


PLATE 3.—The steps of the offensive when the advance to the enemy's first position is made under protection of a rolling barrage

planes, if available, assist in this work, but the bulk of the detailed reconnaissance is done by infantry.

g. The difficulty of reconnaissance increases in proportion to the measures adopted by the enemy to screen himself.

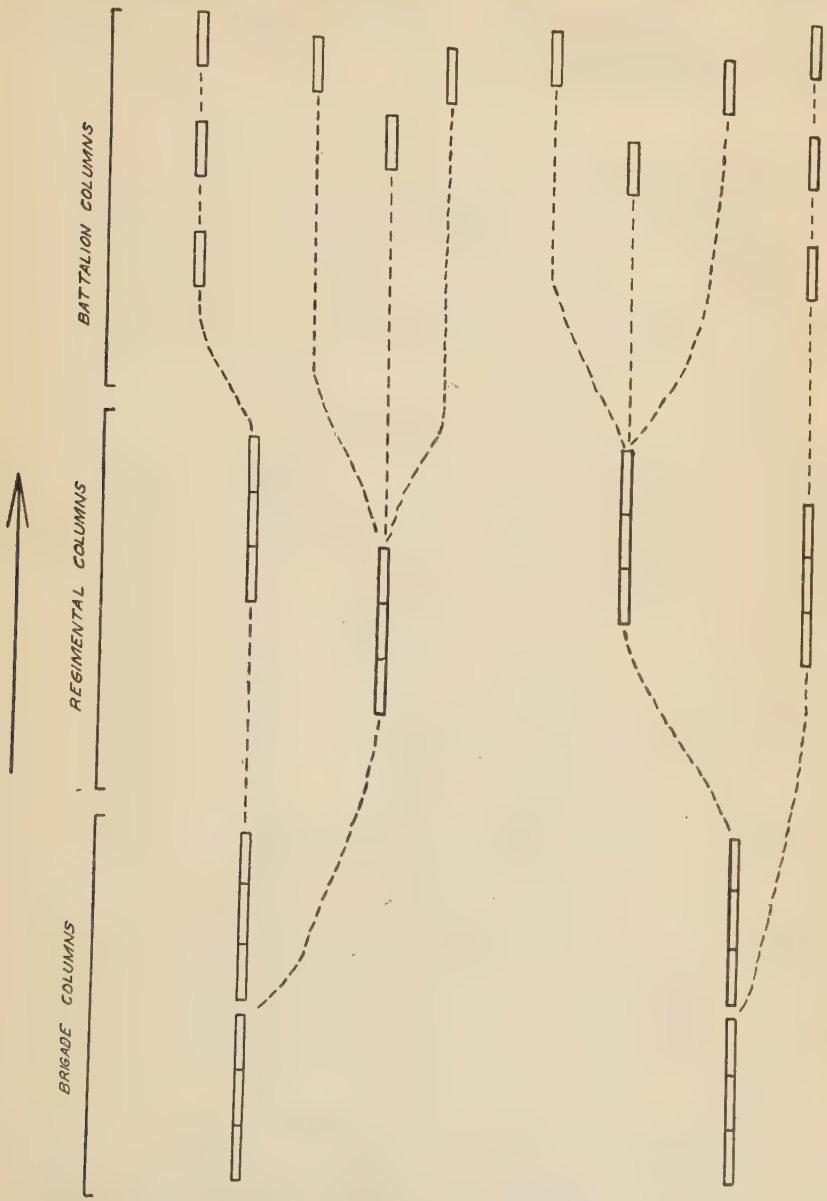


PLATE 4.—Advance in route column

h. The strength of the reconnaissance detachment is determined by the character of the information desired and the nature of the hostile screen. In exceptional cases, as much as a battalion is necessary to break through the hostile screen to enable the commander or officer in charge to reconnoiter

in person. It is frequently necessary to send forward a thin skirmish line to induce the enemy to open fire and reveal his position.

i. A large reconnaissance detachment is conducted so as to open the way for small patrols, to serve as a supporting force or rallying point for them, and to receive and transmit information. (See pl. 5.)

j. In order to surprise the enemy, the advance in route column will often be made under the cover of darkness so that hostile airplanes can not observe the movement. Troops then do their marching at night, concealing themselves by day in woods or buildings.

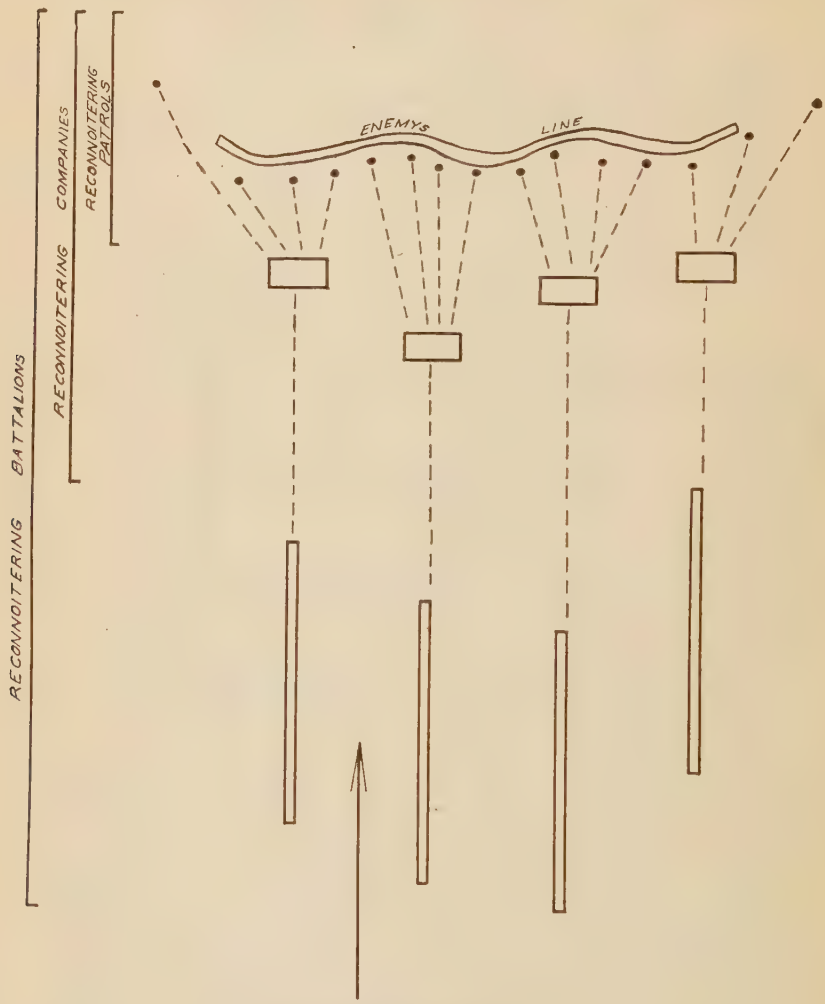


PLATE 5.—Reconnaissance

3. The approach march and deployment.—*a.* The approach march is the advance from the point where the zone of hostile fire is entered, up to the point where it becomes necessary to return the enemy's fire in order to continue without undue losses.

b. After entering the zone of hostile fire, infantry ordinarily advances a long distance before it is justified in opening fire. Infantry can not combat the enemy's artillery or his high-flying airplanes and it is at a disadvantage if it attempts to combat the enemy's long-range rifle and machine-gun fire, since by

stopping to fire it provides a stationary target upon which the hostile artillery can easily range and, besides, no serious damage can be inflicted upon the enemy with long-range infantry fire.

c. Therefore, infantry units ignore hostile artillery fire, high-flying airplanes, and long-range rifle and machine-gun fire and, by taking full advantage of cover, of the discipline of the troops, and of suitable formations, continue to advance rapidly until within effective range of the enemy's infantry before opening fire. Protection against low-flying airplanes is assured by the assignment of machine guns and platoons of riflemen to antiaircraft missions. Supporting artillery may open fire on hostile batteries which have been located by airplane reconnaissance.

d. However, rapid advance and the utilization of cover are not sufficient protection against hostile artillery fire, aerial bombing, and long-range rifle and machine-gun fire. In addition, infantry units must change their formation from route column to an approach formation so that concentrated targets will not be offered to the enemy's fire and so that the troops will be suitably disposed to take up the fire fight when they reach a point within effective range of the enemy and to continue it to a successful conclusion. The arrangement of troops in combat formation is deployment.

e. As a general rule, a zone of advance or a definite frontage is assigned to each unit before taking up the approach march. From the width of the zone of advance or the frontage assigned, other factors, such as the nature of the terrain, being also considered, each unit commander decides how to dispose the component parts of his command.

f. It will generally be necessary at some stage of the combat to use all the troops in order to gain decisive results, but in the beginning each commander usually holds out a portion of his unit for emergencies. The portion which platoon and company commanders hold out is called a support, while that held out by the commanders of units larger than a company is called a reserve. The remainder of a unit is called its assaulting echelon. (See pls. 6 and 7.)

g. The strength of the portion of a unit held in support or reserve is controlled largely by the front over which it must deploy. However, frontages are usually assigned so that platoons can begin the action with one section in support, companies with one or two platoons in support, and the larger units with one-sixth to two-thirds in reserve.

h. The holding out of supports and reserves at the beginning of an action results in deployment in depth.

i. Deployment of a unit is complete and a unit is said to be deployed for attack when its elements are disposed so that the front assigned to it can be covered with fire and when its leading platoons are able to open fire either immediately, without change of formation, or after a simple and prescribed change.

j. Deployment may take place gradually during the approach march or complete deployment may be made direct from route column. When deployment takes place gradually, it is usually an expansion of the route column into smaller columns, which are successively broken up into still smaller columns, until deployment is complete.

k. During the approach march sufficient distance and interval are maintained between columns to prevent any two of them being taken under the burst of the same hostile shell or aerial bomb. (See pl. 8.)

l. When the approach march is conducted by daylight, units are usually disposed from the beginning in echelons corresponding to those of complete deployment. When the approach march is made at night, units usually advance by battalions with the small columns disposed one behind the other until the so-called line of departure or "jump-off" line is reached, where the deployment for attack is made.

m. By daylight the approach march is conducted in a series of bounds, direction being usually maintained by compass. Each small column directs its march from one to another of the successive points which define the route of advance.

n. During the approach march systematic reconnaissance is carried out with a view to locating shelled and gassed areas. These areas and other points, such as villages, defiles, and small woods, likely to have been registered by hostile artillery fire, are avoided.

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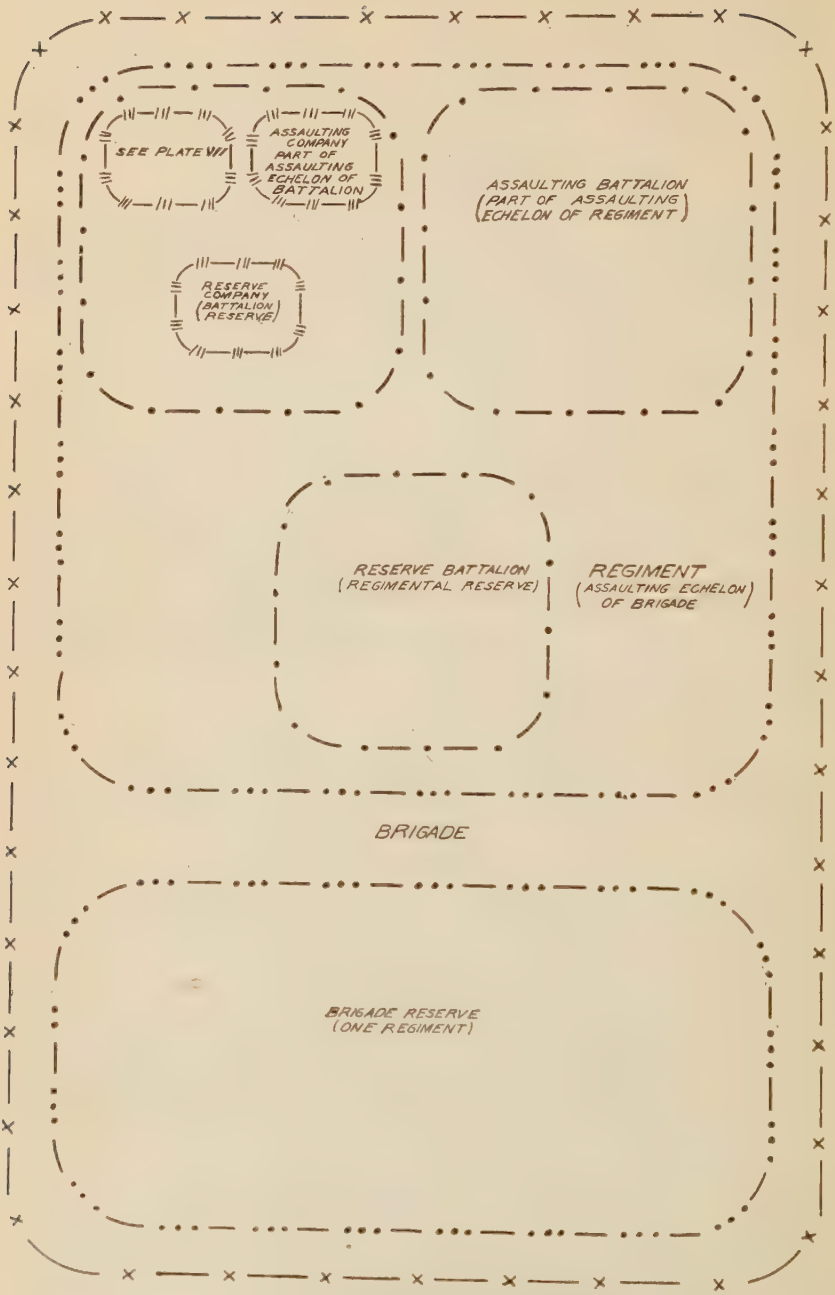


PLATE 6.—A deployment of a brigade

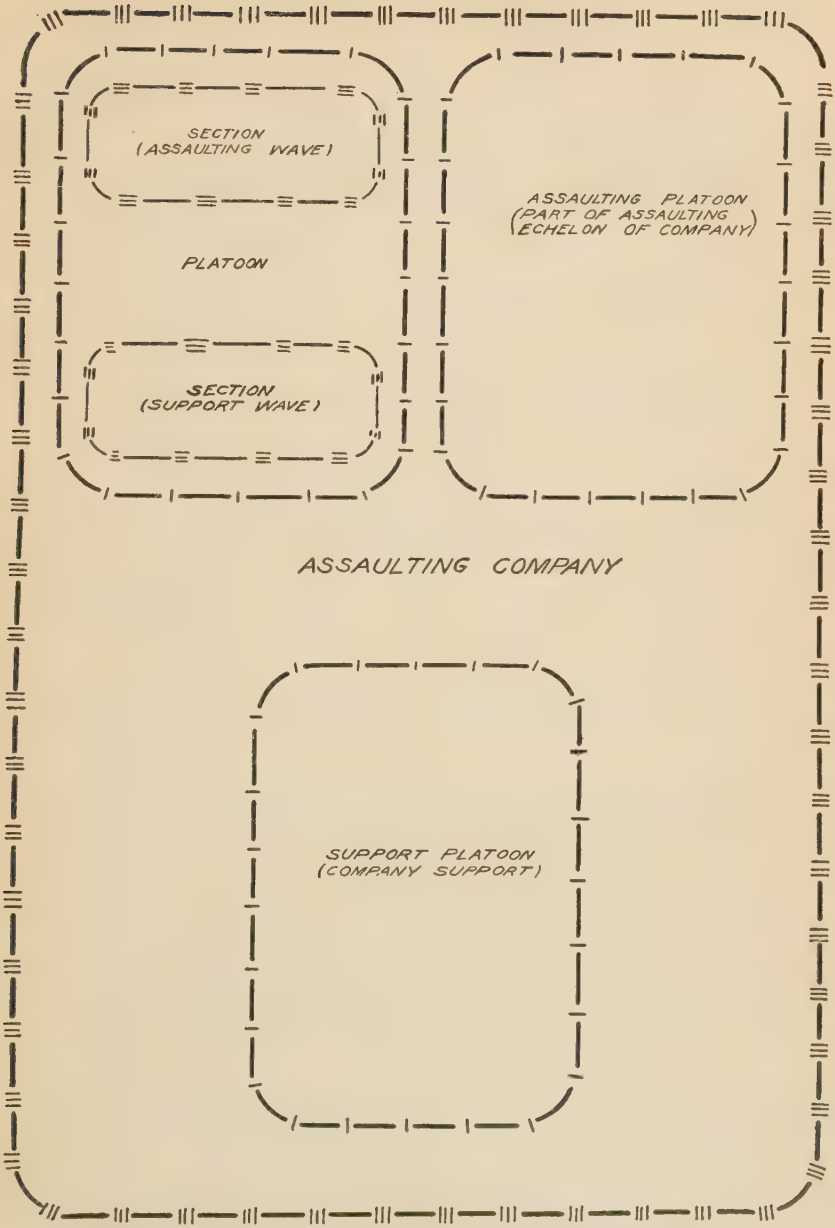


PLATE 7.—A deployment of an assaulting company

o. In the approach march it will sometimes be necessary to cross fire-swept zones by having individuals work their way forward separately and re-form on a designated position. This method of advance is called infiltration.

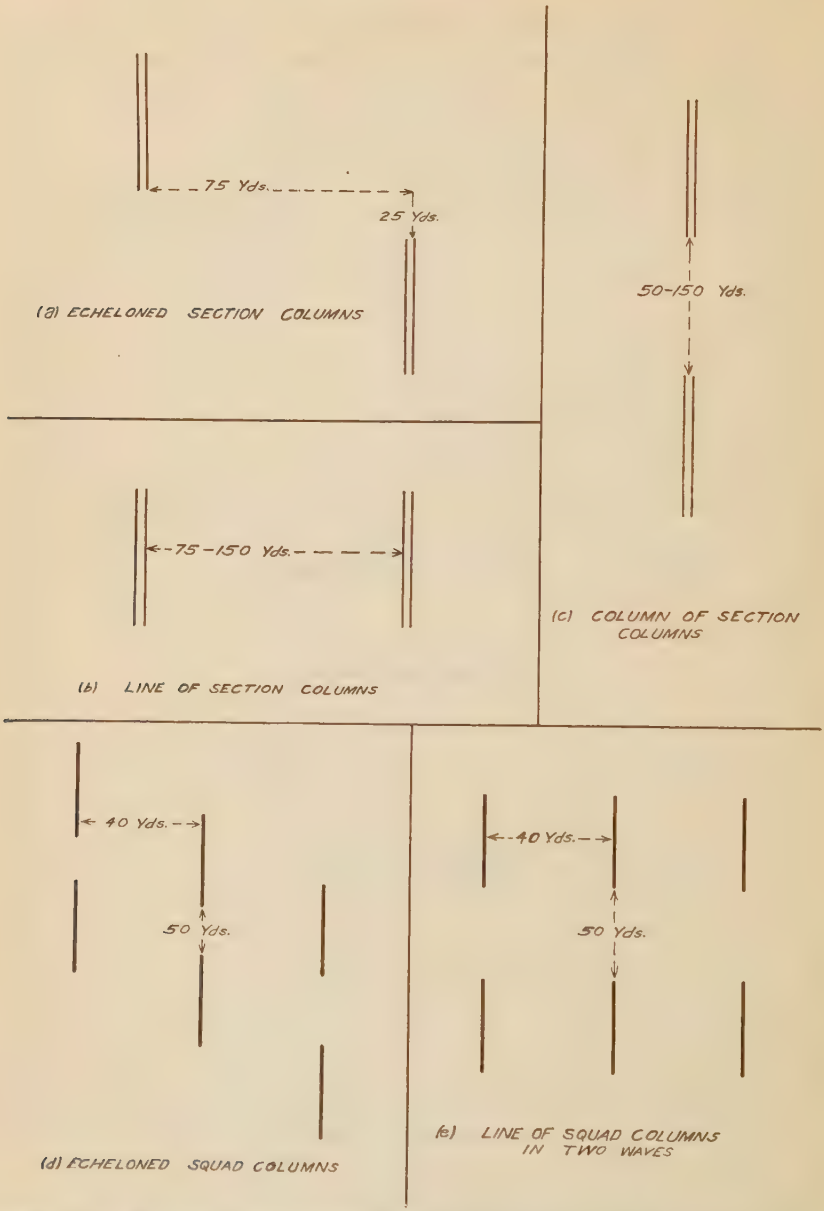


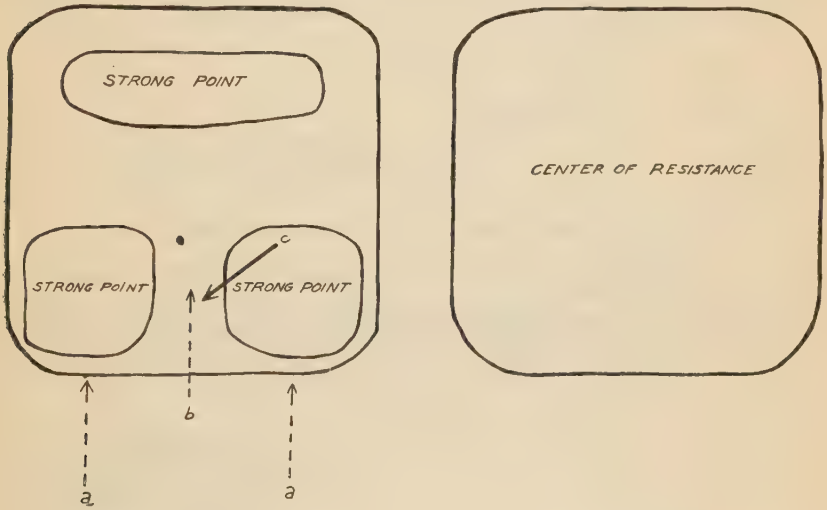
PLATE 8.—The separation of small columns in the approach march in order to avoid two elements coming under the same burst of a single hostile shell or aerial bomb

p. At the first firing position each attacking unit seeks to gain fire superiority pass through deployed artillery. This is done in such manner as will interfere as little as possible with the latter's fire, and never so as to cause that fire to cease entirely. As far as practicable, advantage is taken of intervals in the line.

4. Advancing the attack.—*a.* When the effectiveness of hostile fire makes it necessary for the infantry to return the enemy's fire in order to continue the advance without excessive losses, the advance by fire and movement is begun. This is called advancing the attack.

b. At the first firing position each attacking unit seeks to gain fire superiority over the enemy to its front. Fire superiority is obtained by subjecting the enemy to such heavy fire that his fire becomes so inaccurate or diminishes so in volume that it is no longer effective. This sometimes necessitates a steady, accurate fire for a long time.

c. Once fire superiority has been gained, a sufficient number of all infantry weapons as well as artillery must be continued in action to maintain it. Therefore, further advance is made by infiltration or by successive rushes of fractions of the troops engaged in the fire fight. The movement of advancing fractions is covered by the fire of those remaining in position. The size of the



a ATTACKS WHICH ENCOUNTER STRONG RESISTANCE IN THEIR FRONT.
b ATTACK WHICH HAS PENETRATED THE HOSTILE FRONT.
c HOSTILE COUNTER ATTACK MADE TO OVERWHELM THE ASSAULTING ELEMENTS WHICH HAVE PENETRATED THE HOSTILE FRONT.

PLATE 9.—The character of the resistance usually encountered and the enemy's usual method of limiting penetration of counterattack

fraction advancing is determined by the amount of fire which can be spared without losing fire superiority.

d. Every lull in hostile fire is utilized to push groups to the front and occupy the natural strong points of the terrain from which covering fire, particularly that of automatic weapons, can be delivered to facilitate the further progress of the assaulting units.

e. The attack will not generally encounter a uniformly held continuous line of defense. It will have to overcome a defense disposed in depth consisting of a series of centers of resistance or strong points covering the main routes of advance, with relatively lightly held intervening intervals. By a stubborn defense of these localities, the defense will seek to limit the penetrating action of the attack and overwhelm by counterattack the assaulting elements which succeed in penetrating its front. (See pl. 9.) There will consequently be inequality in the resistance encountered on the front of attack and as a result the assaulting units will not make uniform progress. Each unit presses on as rapidly as possible within its own zone of action, but certain units of considerable size will be held up by strong resistance while others which encounter only minor resistance will be able to advance. The latter press on without regard to the progress of the units held up and then attempt to outflank the main

hostile resistances. (See pl. 10.) The battle thus becomes a series of local combats carried on by units of varying size.

f. Sections of the assaulting echelon held up are not reinforced when the resistance in their front can be outflanked. By their own fire and that of the accompanying weapons, they attempt to neutralize or mask the opposing re-

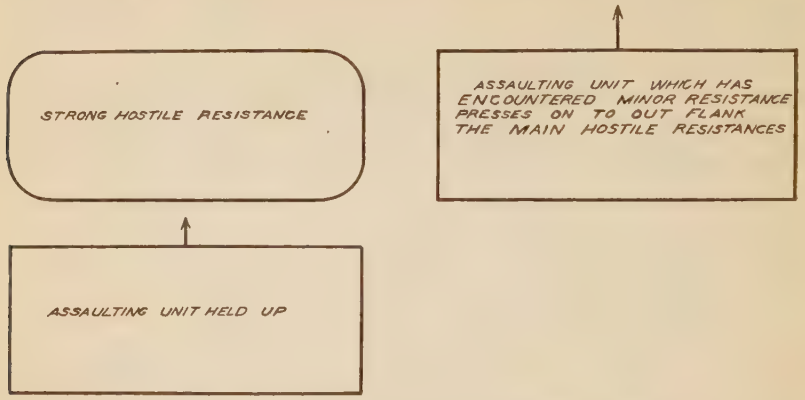


PLATE 10.—The outflanking of a strong hostile resistance

sistance and prevent the latter from enfilading the attacking elements advancing on the flanks.

g. Assaulting units endeavor to obtain superiority of fire over the defensive elements into which the hostile dispositions are broken up by enveloping action. (See pl. 11.) The leading elements of each unit advance straight to

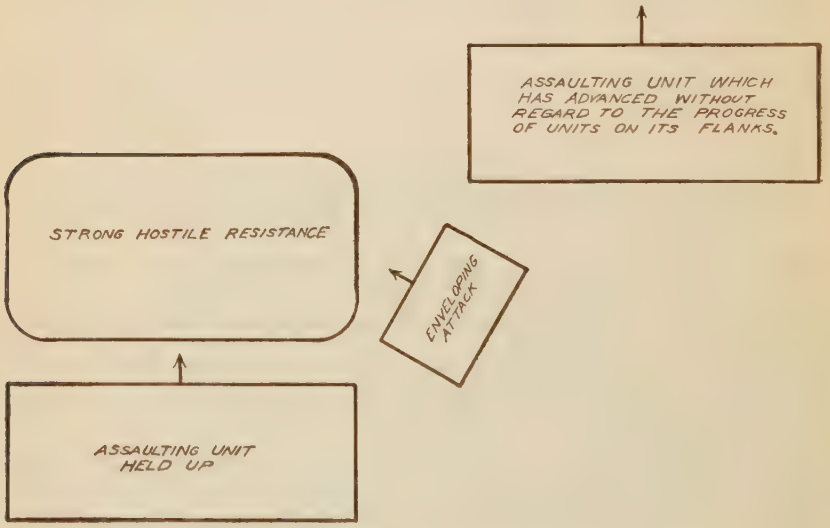


PLATE 11.—The enveloping of a strong hostile resistance which has been outflanked

the front, push as closely as possible to the hostile position and immobilize the enemy with fire. While this is being done, additional forces (supports and reserves) are brought up on the flanks to envelop the enemy or gain his rear. The advantage of the enveloping action consists in the longer line with conse-

quent superiority in the number of weapons in action and in convergent fire as opposed to the enemy's divergent fire. (See pl. 12.)

h. In many cases, however, the mutual flanking fire of hostile centers of resistance will be unfavorable to enveloping action. In such case, frontal attack is necessary.

i. During the attack, supports and reserves do not passively follow the troops engaged in the fire fight. On the contrary, one of the purposes of the disposition in depth is to enable the attacking units to act in any direction.

(1) Supports are employed to reinforce the assaulting echelon and protect its flanks. Reinforcement may take place by increasing the density of the echelon, by filling in gaps, or by prolongation of the echelon (enveloping action). (See pl. 13.)

(2) Reserves are employed primarily to envelop points of resistance outflanked by the assaulting echelon, to continue the action of assaulting echelons which have been disorganized, depleted, or exhausted, and to take in flank hostile counterattacks directed at a section of the assaulting echelon. (See pl. 14.)

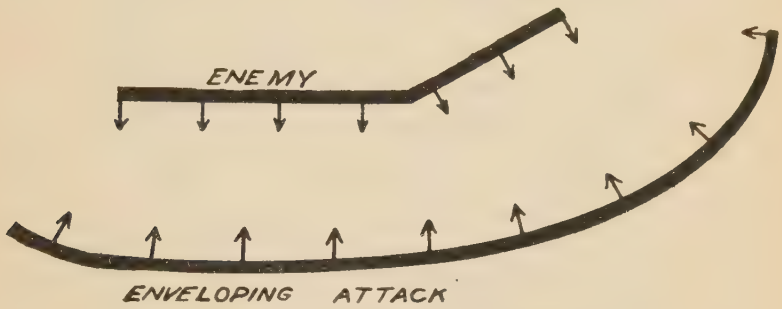


PLATE 12.—The advantages of enveloping action

5. The assault.—*a.* The assault is the last advance to the enemy's position without intermediate halt.

b. Assaults are of two kinds:

(1) General assaults.

(2) Local assaults.

c. General assaults.—(1) A general assault is an assault on an extended front. Such assaults are practicable only when the opposing troops have been in close contact for a considerable time.

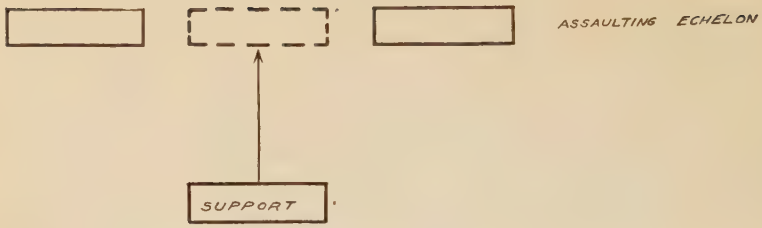
(2) General assaults are often made under the protection of a rolling barrage. In such cases, complete deployment is made before the assault is launched. In making the assault, infantry units advance in an orderly manner under cover of the rolling barrage, the leading elements following the barrage as closely as possible consistent with safety, until close to the enemy's position when the general assault breaks up into local assaults.

(3) General assaults are sometimes produced by the employment of divisions and larger reserves to strike a decisive blow against some part of the hostile line. In such cases, all the fire available, particularly that of the artillery, is brought to bear on the decisive part of the battlefield and under cover of this fire the infantry advances rapidly to the assault of the enemy's position.

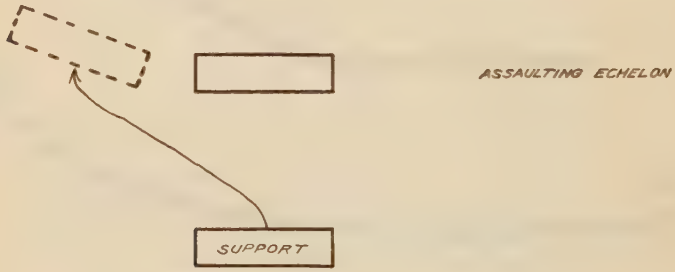
d. Local assaults.—(1) A local assault is an assault initiated and executed by a small unit (squad, section, platoon, company, or battalion) in order to take immediate advantage of a weakening in the hostile resistance. They are delivered by each unit at the earliest moment that promise success.

(2) Local assaults are usually executed by advancing and firing simultaneously. Automatic riflemen advance at a walk firing from the hip; riflemen fix bayonets and advance at a walk, stop every few steps to fire standing, and reload while advancing. This class of fire is called assault fire.

(3) Sometimes in making local assaults, the rifle and automatic-rifle fire can be dispensed with. In such cases, the assaulting troops make their final advance to the enemy's position either at a walk or run.



(a) SUPPORT REINFORCING THE ASSAULTING ECHELON BY FILLING A GAP.

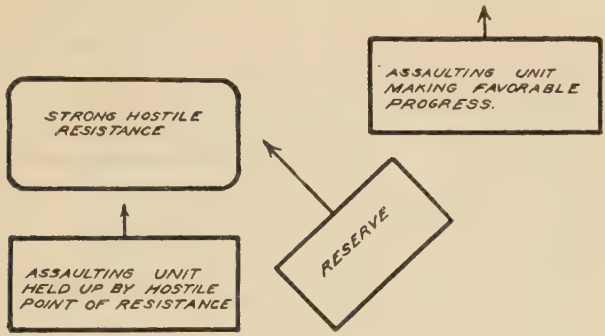


(b) SUPPORT REINFORCING THE ASSAULTING ECHELON BY PROLONGING THE ECHELON.

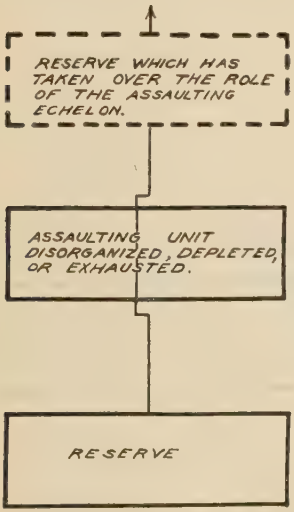
(c) SUPPORT REINFORCING THE ASSAULTING ECHELON BY INCREASING ITS DENSITY.

Plate 13.—Reinforcement of the assaulting echelon of a unit by its support

(4) Another class of local assault is the prepared assault. A prepared assault is one made on a portion of the enemy's position which can be taken only by a frontal attack, supported by artillery. In such a case, a heavy volume of artillery, machine-gun, 3-inch trench mortar, and 37-mm. gun fire is put on the enemy's position. Under cover of this fire, the assaulting troops



(a) RESERVE ENVELOPING POINT OF RESISTANCE WHICH HAS BEEN OUT FLANKED.

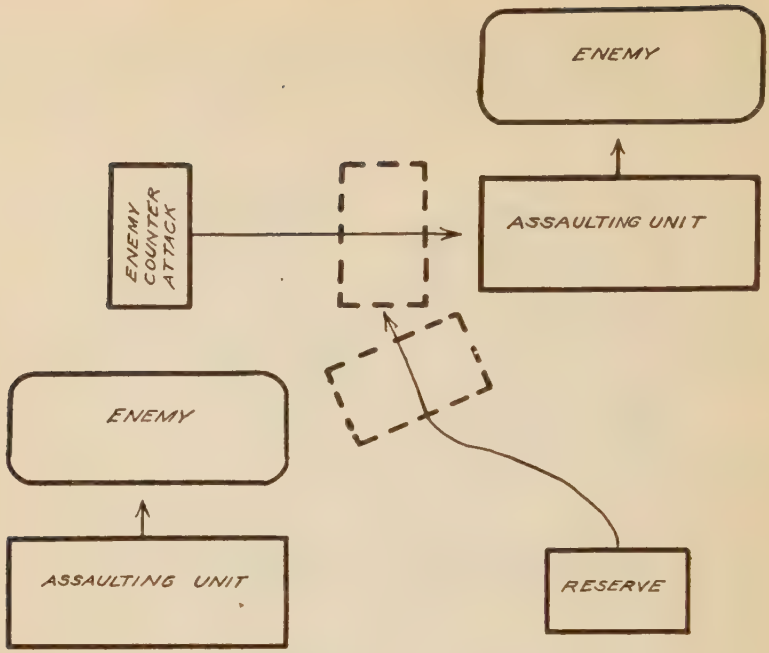


(b) PASSAGE OF LINES.

PLATE 14.—The employment of reserves

work their way forward as close to the enemy's position as possible and, when the preparatory fire lifts or ceases at prearranged signal or hour, assault the enemy's position.

e. When the assaulting troops reach the enemy's position, the fight continues both above ground and through the trenches. Underground shelters are bombed and trenches are searched for the enemy; this is called "cleaning up" or "mopping up."



(c) RESERVE EMPLOYED TO TAKE IN FLANK A HOSTILE COUNTER ATTACK DIRECTED AT A SECTION OF THE ASSAULTING ECHELON.

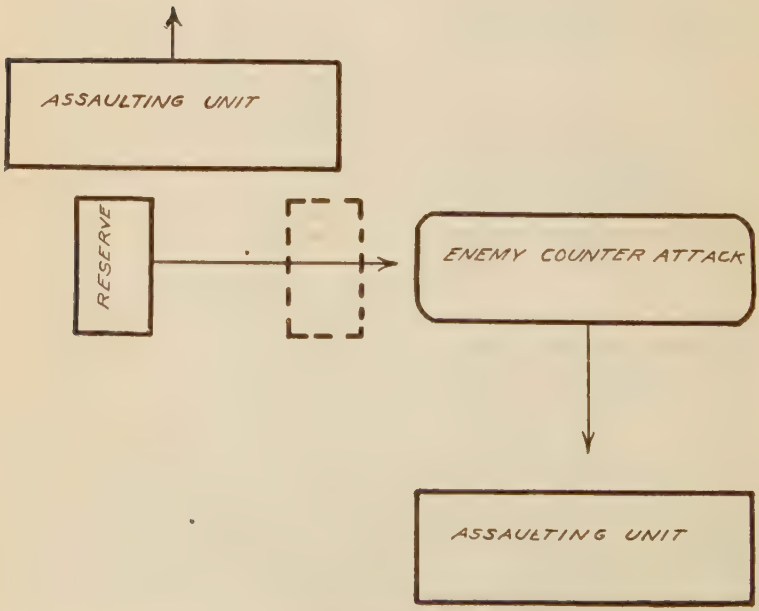


PLATE 14.—(Continued)

f. While part of the troops are cleaning up the enemy's position, others fire at any of the enemy who attempt to escape by running and prepare to continue the attack, take up the pursuit, or organize the ground for defense as may be required by the orders for the attack. Supports and reserves still in hand are held, as far as required, to execute a passage of lines or to meet any counter-attack which the enemy may make.

6. **Continuing the attack, passage of lines, and reorganization.**—The attack of successive positions in rear of the first is made in a manner similar to that explained for the attack of the first position. As soon as the first position has been seized, each assault unit continues on to seize the other successive position in rear. The advance is usually begun in a deployed formation and the retreating enemy closely followed. If the distance to the second position be considerable and the opening of fire on this position by our infantry is not immediately justifiable, approach formations may become desirable.

During assaults, the smaller assault units (squads, platoons, and companies) often become badly mixed and disorganized, and during prolonged attacks larger assault units become exhausted and depleted. In such cases supports and reserves pass through or by disorganized assault units and continue the attack until the latter halt, reorganize, and follow as support or reserve. This is called a passage of lines.

7. **Pursuit.**—*a.* As stated in paragraph 5 *f*, the troops in the assaulting echelon, after capturing an enemy position, fire on any of the enemy who attempt to escape by running and prepare to continue the attack, take up the pursuit, or organize the ground for defense as may be required by orders for the attack. This is called pursuit by fire. The pursuit proper, which is the act of following a retreating enemy to complete his capture, demoralization, or destruction, is begun by units in the assaulting echelon when the danger of a counterattack seems removed and when reorganization has been effected. If the retreating enemy gets beyond range, numerous patrols are sent out to follow and maintain contact with the enemy.

b. As soon as practicable, a coordinated pursuit of the enemy is inaugurated. Any reserves which are still intact are employed for this purpose; they pass through the assaulting echelon and take up the pursuit, the former assaulting echelon following in reserve as soon as reorganization has been effected. If no reserves are intact, the assaulting echelon, after reorganization, takes up the pursuit.

c. Pursuing troops advance in formations adapted to the situation. While under hostile fire they are deployed as described in advancing the attack and approach march. When not under fire they advance in route column.

d. The enemy is vigorously attacked wherever found. While part of the troops are attacking in front, others work around the flank to cut off and destroy or capture the retreating troops.

8. **Organization of the ground.**—Whenever the advance of a unit is definitely held up and further progress is impossible, the troops dig in and hold their ground. This is called organization of the ground.

The longer troops remain stationary, the more thoroughly is the ground organized. At first each man digs himself an individual shelter. Later on these shelters are connected, and gradually continuous trenches are developed. Obstacles are put out in front and everything possible is done to reduce losses and facilitate holding the ground.

TRAINING REGULATIONS, NO. 420–105

INFANTRY

Combat Principles—The Rifle Squad

		Paragraphs
SECTION I.	Squad in attack and defense	1–8
II.	Squad in service of security	9–14
III.	Estimate of the situation, orders and messages	15–17

Section I.—SQUAD IN ATTACK AND DEFENSE

	Paragraph
Approach march	1
Building up the firing line	2
The fire fight	3
The assault	4
Reorganization	5
Pursuit	6
Defense	7
Mopping up	8

1. **Approach march.**—*a. Formations.*—Before the infantry reaches a point where it is able to return with rifle and automatic rifle the fire of the enemy, it takes up a formation which will reduce losses and enable it to deploy quickly. In this phase, which is called the approach march, squads are in squad columns, skirmish line, or part of a section column. The initial formation is prescribed by higher command.

b. Squad columns.—During the approach march in squad columns, the position of the leader is at the head of the column. In the open, distances between men in the squad should be from 5 to 10 yards. In woods or at night, distances should be much less.

PLATE 15.—Squad in squad column in approach march

c. Squad as skirmishers.—In skirmish line, during the approach march, the squad leader's position is in front of his squad. In the open, intervals between men in the squad should be not less than 5 yards.

d. Scouts.—A squad which is part of the leading section of an assault wave is preceded by its scouts.

e. Duties of squad leader.—During the approach march, the duties of the squad leader are:

(1) To guide on the section leader.

(2) To study the ground to the front for ditches, folds in the ground and similar cover leading toward the enemy.

f. Duties of second in command in squad column.—In squad column, the position of the second in comand is in rear of the squad. (See pl. 15.) He prevents straggling and insures the orderly advance of the squad.

g. Position of second in command in skirmish line.—When the squad is in skirmish line, the second in command is usually in the line. He may be placed in rear by his squad leader.

h. Primary duty of second in command.—During the absence of the squad leader, the second in command will take charge.

PLATE 16.—Squad as skirmishers in approach march

i. Passing through long-range fire.—In the approach march it is sometimes necessary to pass through enemy artillery or long-range machine-gun fire. Squad leaders may be directed to re-form their squads at a certain point or on a certain line beyond the area which is being shelled. In this case each squad moves independently of the others. If cover is available, the squad leader by taking advantage of it works his squad forward. If there is no cover, he works the squad across by bounds, one or two men at a time.

PROBLEM No. 1

Your section in an approach march reached A. There your section leader orders squad leaders to take charge of their squads and re-form the section at B.

How would you get your squad across the area being shelled? (Pl. 17.)

2. Building up the firing line.—*a. Duties of squad leader.*—When the section is halted by fire, the duties of the squad leader are:

(1) *To get the squad under cover when the section halts.*—He selects for this purpose such cover as folds in the ground, ditches, or shell holes. He confines his choice to cover near by, usually within 30 yards.

(2) *To study the ground to his front.*—He will look for covered ways to the line of scouts. If ordered to build up the firing line by moving the entire squad forward at one time, he should then know where these routes are and can use them without delay.

b. Re-forming squad on line of scouts.—When ordered to re-form his squad on the scouts, the leader—

(1) Sends ahead one or two men at a time,

(2) Uses cover to send the squad forward as a unit, or

(3) Moves it forward by short rushes.

c. Infiltration.—When there is no cover and the ground to be crossed is swept with fire, one or two men at a time are sent forward. This method of building up the line is called infiltration.

PLATE 17

PLATE 18.—Scouts and section fired on. Squad leader getting squad under cover

If the scouts are out, the automatic rifleman is sent forward first and is followed by the substitute automatic rifleman. The squad leader usually follows the substitute. The second in command then sends up the rifle grenadier and the other riflemen in the order named. The second in command goes last.

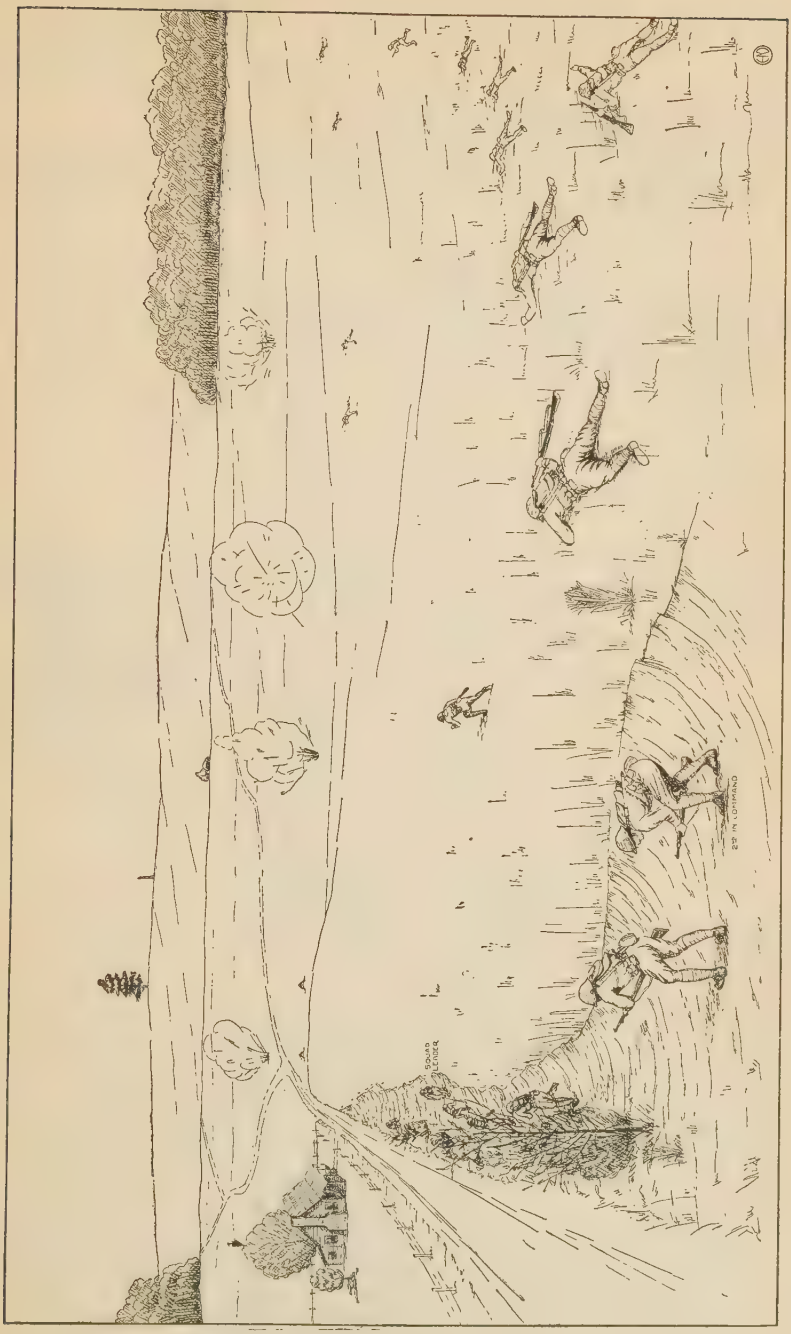


PLATE 19.—Squad working to scouts, using ditch as cover

d. Using covered approach.—The squad advances as a unit when there is a covered approach to the firing line or to a position near the firing line. The usual formation is squad column. The leader is at the head and the second in command in rear. (See pl. 19.)

e. Rushes.—If enemy fire permits and the distance to be covered is short the squad is moved to the firing line by short rushes. Rushing forward is very tiring and is not used for crossing long stretches.

The second in command follows the squad.

f. Reinforcing a firing line.—When members of a squad, reinforcing a section other than their own, mix in the firing line, they will attach themselves to the nearest squad already on the line and obey the orders of its squad leader.

Problem No. 2

In an attack, your scouts were stopped by enemy fire at A. Your squad is under cover at B. The ground from B to A is receiving small-arms fire.

You are ordered to build up the line of scouts.

How do you carry out this order?

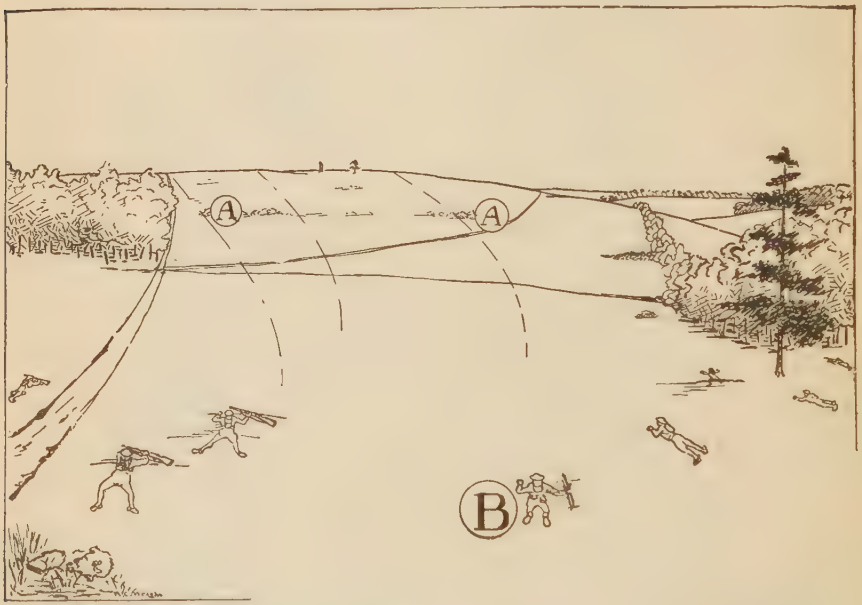


Plate 20

3. The fire fight.—*a.* During the fire fight, the first duty of the squad leader is to enforce fire discipline and control the fire of his squad.

b. He looks ahead for firing positions which his squad can use as the section moves forward.

c. He prevents the members of his squad from scattering too much to get cover. The more the squad scatters, the more difficult is control.

d. He must not allow several men to bunch behind cover that is suitable for only one man.

e. A prominent tree, stump, bush, or other well-defined object may draw heavy fire from the enemy. Such cover is avoided. Small depressions, folds and ditches are less visible to the enemy and consequently will attract less fire than the more prominent features. The best protection is the fire of the squad and friendly troops. Such fire keeps the enemy pinned down and prevents him from firing accurately.

f. During lulls in the fight, the squad leader checks ammunition, has ammunition collected from dead and wounded, and causes the magazines of the automatic rifle to be refilled.

g. During an attack, the squad leader, except when actually on the firing line enforcing fire discipline or firing himself, takes position where he can—

(1) See the target.
(2) Control the squad.
(3) Be in touch with section headquarters.

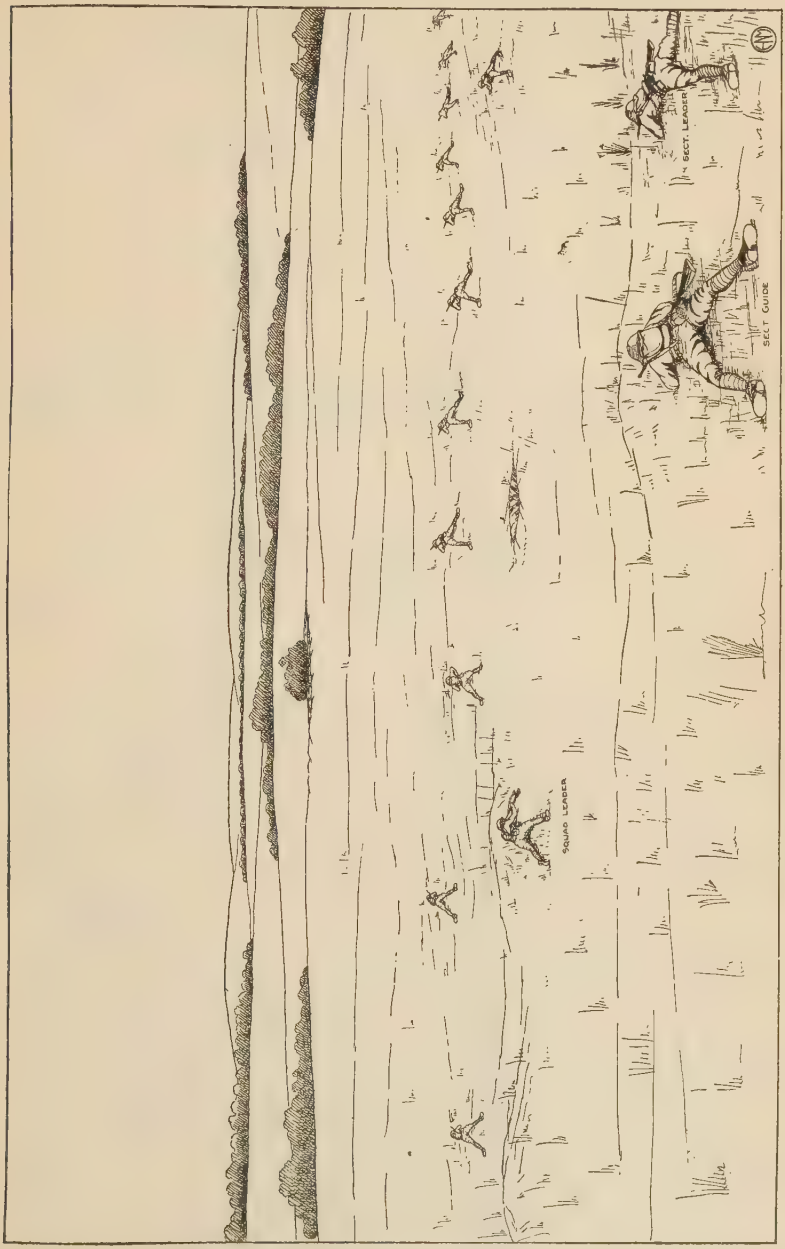


PLATE 21.—Suitable positions for squad leader in a fire fight

h. The squad leader must be able to see the target. To do so, he may have to move off to a flank or to get on the firing line. It is only by watching the target that the leader is able to know the effect of the fire of his squad.

i. There will usually be several positions near by from which the squad leader can watch the target. In this case, he takes the one from which he can best control his men. The leader is not tied down to one position. When it is necessary, he goes to the firing line and makes corrections. He may move about in rear of the squad whenever he sees fit.

j. The squad leader should at all times be in touch with section headquarters. He looks frequently toward section headquarters for signals. He does not for this purpose go so far from the squad as to lose control of it.

PROBLEM NO. 3

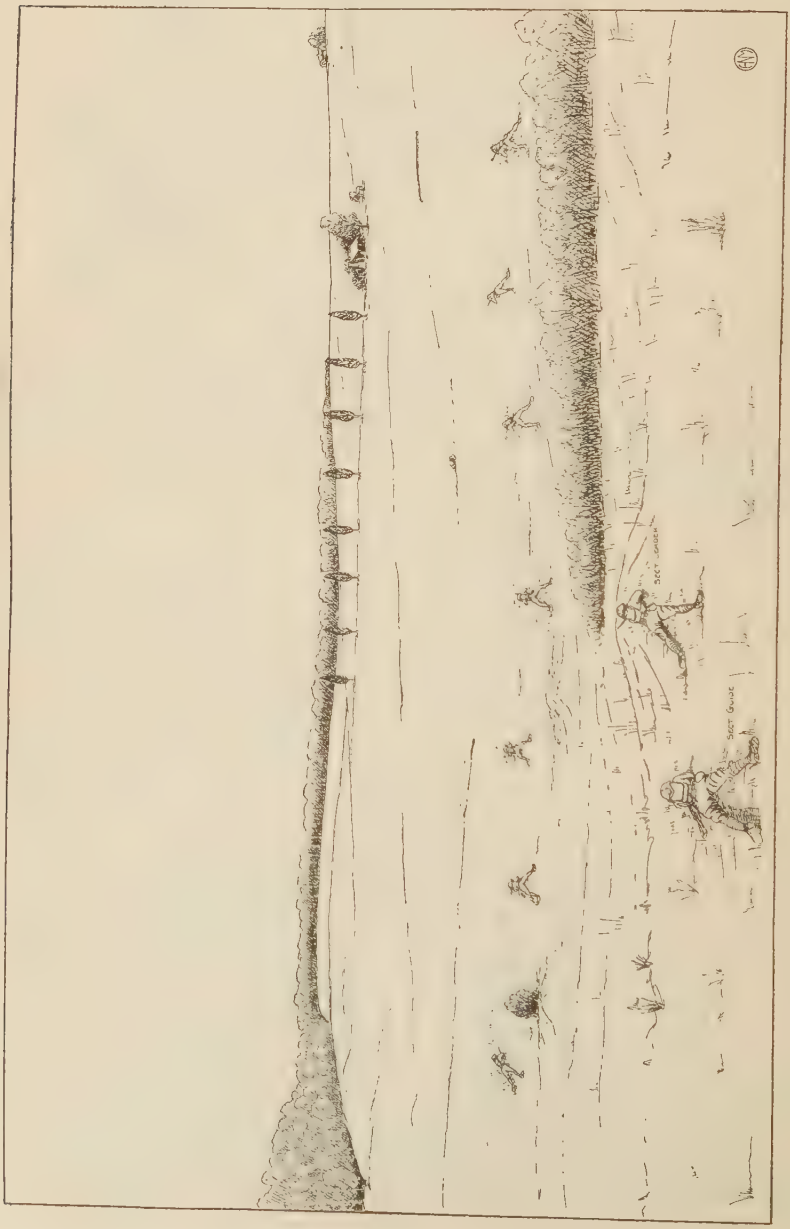


PLATE 22

Your section is firing as indicated in Plate 22. You are leader of the squad shown in the sketch. You yourself are not represented.

During the fight here, what will be your position when you are in rear of the squad? Why do you take this position?

k. The squad leader himself fires only under unusual circumstances, as in defense when the enemy is finally closing and beginning his assault. It is usually more important for the squad leader to control the fire of seven rifles than it is to have eight rifles firing uncontrolled.

l. Control under fire is always difficult. When close to the enemy, the noise of firing usually makes use of the voice at 20, 10, or even 5 yards impossible. The squad leader then moves from man to man in order to give his orders.

m. During the last stages of the fire fight, or at other times when control by

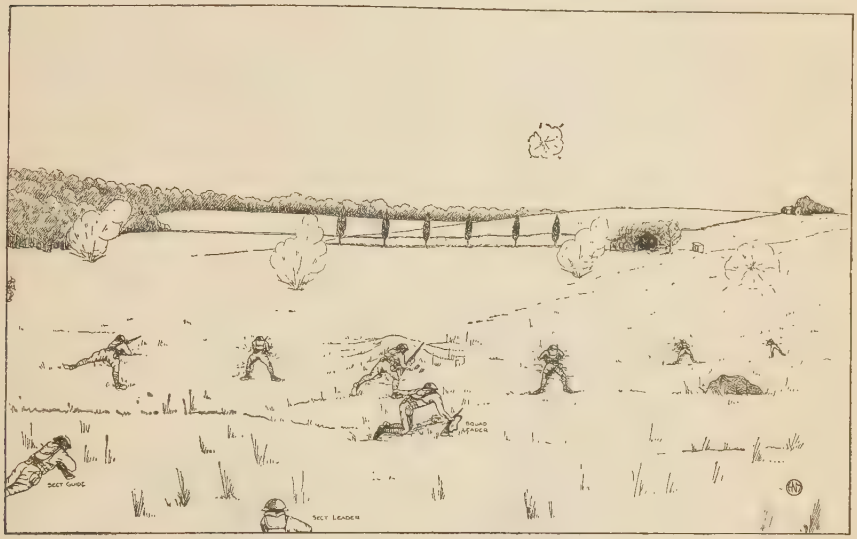


PLATE 23.—Squad in fire fight. Leader going from man to man to give his orders

the section leader has become lost, the squad leader will often have to attack targets without orders.

n. Targets threatening a flank are resisted by fire of the automatic rifle, and when in range by rifle grenades. Riflemen must continue to engage the enemy in their front.

PROBLEM NO. 4

Your section is fighting at A. Your squad is on the right of the section. You are getting small-arms fire from the direction of B. You decide that the fire is coming from a machine rifle or machine gun at C.

What do you do? (Pl. 25.)

o. Should the squad become separated from its section, it must under no circumstances fall back. Every effort must be made to locate and join near-by friendly troops. The squad is then under orders of the leader of these troops.

4. The assault.—*a. Methods.*—The assault may be made either when following a rolling barrage or without a rolling barrage.

b. Following a rolling barrage.—The squad leader will be given in orders the distance at which the barrage is to be followed. Such distance will usually be about 100 yards. The leader moves in rear of his squad and guides on the base unit. As soon as the barrage lifts, he causes his squad to rush the enemy's trench or line and overcome any remaining resistance with bayonet and grenade. (See pl. 26.)

c. Without a rolling barrage.—When there is no rolling barrage, the moment of taking up the assault can not be determined ahead of time. The assault

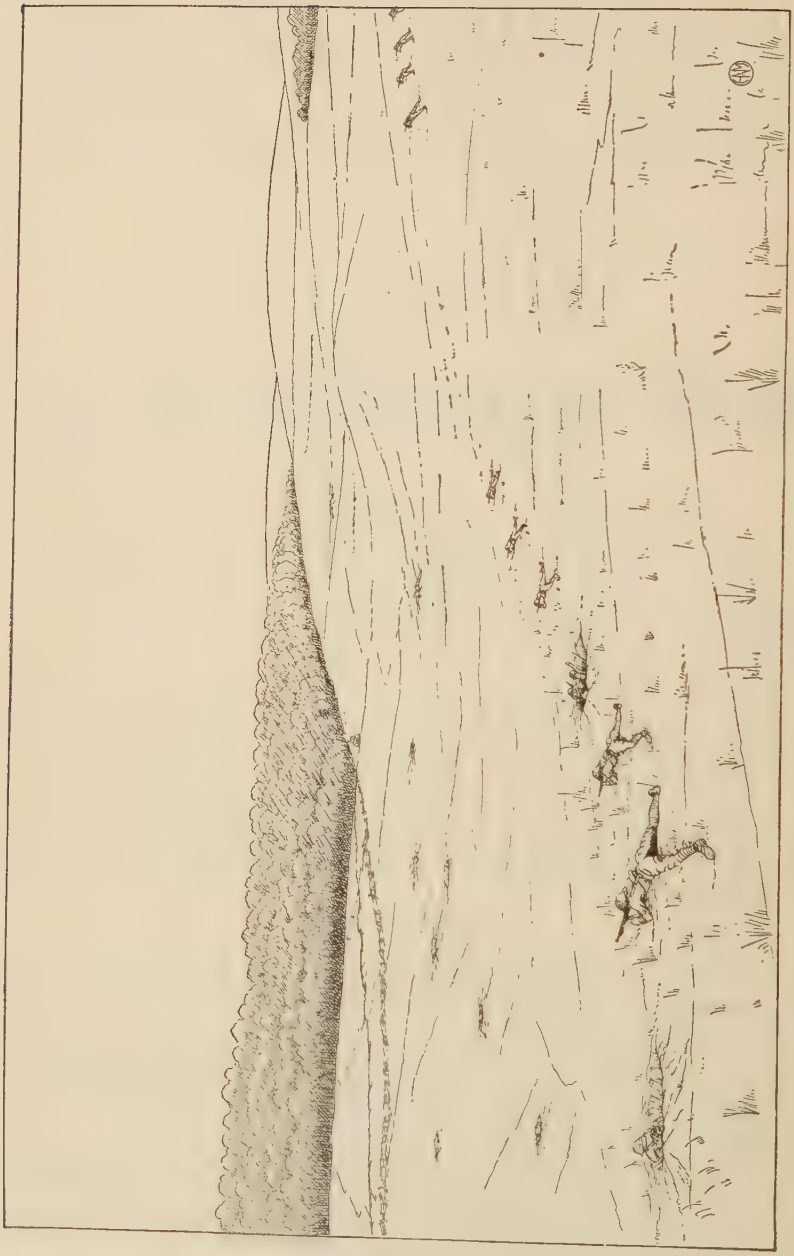


PLATE 24.—Squad in fire fight. Leader directing automatic rifle fire on target to flank

may be started either by order of platoon or section leaders or by one man or two or three men who get up and begin walking or rushing forward. The squad leader immediately causes all other men in his squad to rise and move to the assault.

d. Methods of assault.—The assault may begin at 400 yards from the enemy position or it may not be launched until the rifle groups are only 40 yards away.

A beaten enemy sometimes leaves his defenses, when a determined attack is on, before he is threatened with the bayonet. In this case, the action to be taken will be indicated by section leaders.

More often the enemy will resist with rifle, machine gun, and artillery fire until the rifle groups close with him and actually occupy his defenses. Usually the groups work closer under cover of friendly fire and of their own fire. By rushing one or two men forward at a time, the group finally reaches and enters the hostile position.

e. Assault fire.—In woods, and sometimes in the open, the enemy position may be taken by having riflemen rise and fire as they move forward. The advance is orderly. Squad leaders follow in rear of their squads and keep men on a general line. Riflemen halt individually, aim and fire standing. They go

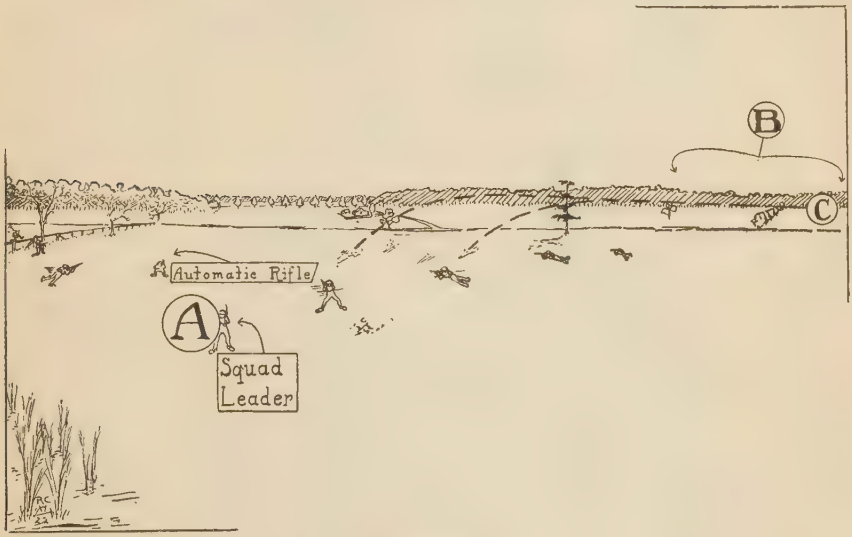


PLATE 25

forward a few steps, halt and fire again. They load while moving. The automatic rifleman fires semiautomatic fire while walking. He holds the butt of the piece under his arm.

f. Duties of squad leaders.—Squad leaders watch for targets appearing suddenly and point these out to the automatic riflemen. In the excitement of the assault, some men will forget to fire or will fire wildly. Leaders must keep men of their squads firing at the locality where the enemy is or is believed to be. The area occupied by the enemy must be covered with fire until the position is actually entered.

5. Reorganization.—*a.* As soon as a position is taken, the leader gets his squad in hand and reports casualties to the section leader or section guide.

b. He then replaces the automatic riflemen and substitute, if necessary. He designates new men as scouts, if the scouts are casualties, and appoints a new second in command if the old one is absent.

Ammunition should be collected from near-by dead and wounded and redistributed among members of the squad.

6. Pursuit.—*a.* The position of the leader in pursuit is at the head of his squad. He guides on the section leader as in the approach march.

b. The position of the second in command is in rear of the squad.

PLATE 26.—Following a rolling barrage

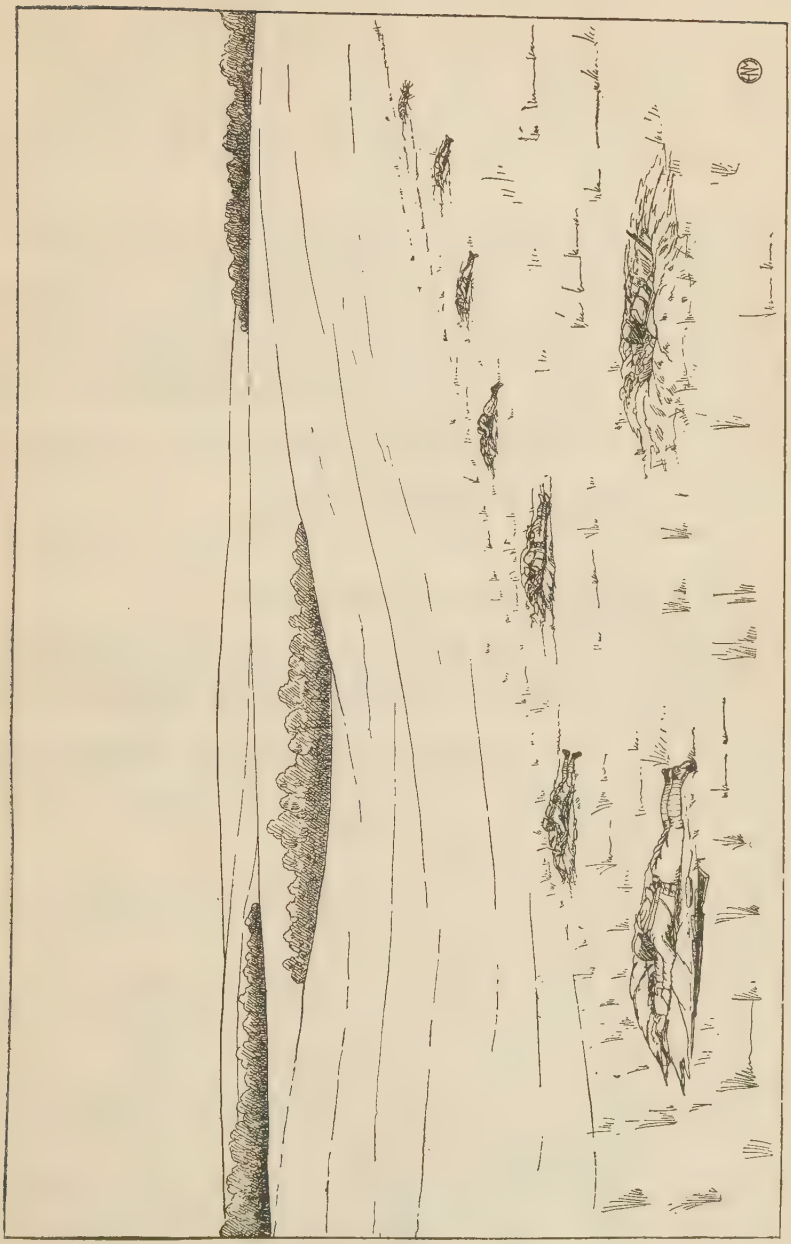


PLATE 27.—Men digging fox-holes, using intrenching tools, meat cans, and meat-can covers

c. Control during the pursuit is very difficult and unless the squad is kept well in hand, it will become disorganized and become separated from its section. Some men have a tendency to loiter around enemy positions. The squad leader takes every measure to keep members of his squad from looting.

7. Defense.—*a.* If at any time in an attack the squad is unable to advance, men are placed in positions from which they can fire on the enemy or cover the ground to the front. Unless they are able to take natural cover, as in a sunken road, ditch, gulley, shell holes, or behind a stone wall, they should dig individual pits. These pits are only rough holes deep enough to afford protection from rifle fire and shell fragments. In digging, men who have no intrenching tools should use canteen cups, knives, meat cans, or meat-can covers.

b. Lying in these pits the men dig toward each other so as to connect the pits rapidly. By so doing they make a rough trench. (See pl. 27.)

c. If the squad is on a flank of the section, the automatic rifleman is placed where he can get a good field of fire to that flank. (See pl. 28.)

d. When trenches have been dug, the squad will be given a definite part to defend. The leader will be told where to place his automatic rifleman, rifle grenadier, and riflemen in case of an attack by the enemy. (See pl. 29.)

e. As soon as he gets these orders, the squad leader instructs all men in their duties, showing them the posts to be occupied if the enemy attacks.

f. Should orders not be received from the section or platoon leader covering the following points, they are asked for:

(1) Positions for the automatic rifleman and rifle grenadier to be used if the enemy attacks.

(2) Direction and location of the enemy.

(3) Location and instructions for use of gas alarms.

(4) Location of and routes to section, platoon, company, and battalion headquarters.

(5) Location of latrines.

(6) Parts of trenches exposed to fire of enemy snipers.

(7) Signals for barrages.

g. When members of his squad are detailed for duty, the leader sees that they are at the place ordered on time and properly equipped. He is at all times responsible for the condition of rifles, equipment, and ammunition of men in his squad. Rifles must be cleaned and oiled by the men and inspected daily by the squad leader.

h. Cartridge niches must be waterproof and their location known to every man. Only a few clips should be kept outside the boxes. Cartridges must never be stuck in the ground.

i. Men of a first line company are always under arms. Rifles are loaded and locked. Safety locks are turned to "Safe."

j. The helmet is worn by all men.

k. The gas mask is carried by all men at all times.

l. Listening posts.—(1) When trenches have been dug and wire placed to the front, small groups will often be posted in the wire to give warning of an enemy raid or attack.

(2) These groups are called listening posts.

(3) The post may be only a shell hole or it may be a prepared pit. It should be reached through a small tunnel or trench running out from the front line trench. (See pl. 30.)

(4) Listening posts are usually occupied by groups of from three men to a squad, under a petty officer.

(5) All men must move with extreme caution from the time they start to the post and, unless the enemy raids, until they are back in the trench. While in the post, all men must be absolutely quiet. Talking must not be permitted. Men should be especially warned not to cough.

(6) At least two men will look and listen all of the time. When the slightest unusual noise is heard, a flare should be thrown in the direction of the sound. If the flare shows only two or three men in or near the wire, they are taken care of by the fire of the sentinels on duty in the trenches. If the flare shows more than that number, so that they appear to be a raiding party, the men in the listening post will throw flares and run back to the platoon. The leader will be the last man to leave. As he leaves, he will drop into place any obstruction at hand which will block the tunnel or trench.

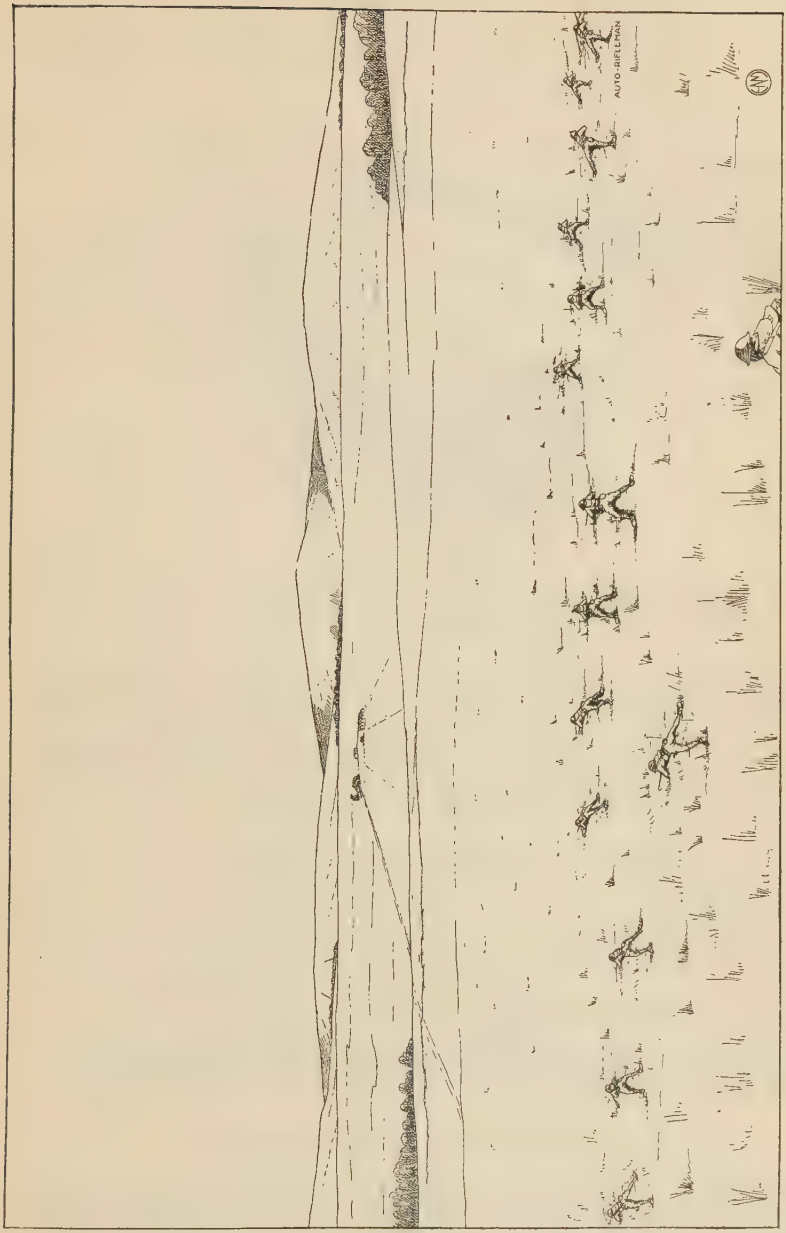


PLATE 28.—Right of section held up, automatic rifleman of right squad in position to cover flank

(7) The post fights only when it must do so in order to keep from being captured.

(8) In the event of a gas attack the alarm is given at once.

(9) Careful watching by these small groups will prevent the enemy from cutting friendly wire and from surprising the platoon.

m. Meeting an attack.—(1) The platoon can meet an attack promptly only when its sentries and observers give immediate warning of any signs of an assembly for attack by hostile troops.

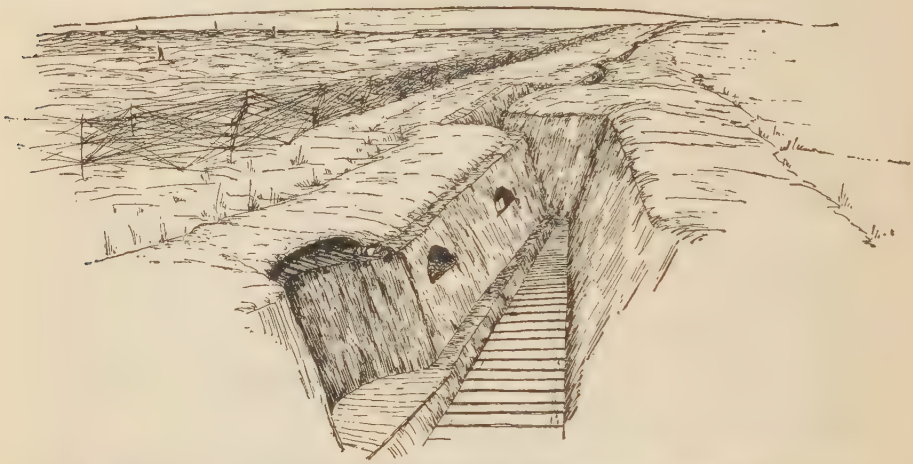


PLATE 29.—Section of trench, showing automatic-rifle emplacements, grenade and small-arms ammunition niches

(2) The leader is responsible that all men of his squad get out promptly. He therefore requires the squad to practice leaving its dugout. At the first note of the alarm, men must leave their shelters and move rapidly to their posts.

(3) Often the enemy bombards the trenches before he attempts to take them. As soon as the bombardment ceases, he attacks. At this time, a few men fighting with determination can break up the entire attack.

PLATE 30.—Section of trench, with listening post

(4) The squad never falls back unless definite orders stating the name of the person who gave the order and the place to which the squad is to go are received. The enemy will sometimes cause an order to be started along the line. Before any order is passed its source must be known.

8. Mopping-up.—*a.* To mop-up or clean-up means to put out of action by killing or capturing any of the enemy left in a position which has been or is being taken.

b. The squad will sometimes be part of a unit ordered to follow, as moppers-up, a platoon which is going to take a position and move on at once.

c. While mopping-up, members of the squad enter a shelter only to clean it out or to take cover when forced to do so by enemy fire.

d. All dugouts, shelters, observation posts, and other possible hiding places for the enemy must be thoroughly cleaned out. Two or three hand grenades will usually be sufficient for this purpose.

e. Members of a squad assigned as moppers-up are not permitted to go beyond the position to be mopped-up nor to mingle with attacking troops. The squad promptly rejoins its section when its task has been finished.

Section II.—SQUAD IN SERVICE OF SECURITY

	Paragraph
Providing flank protection on the march	9
Flank combat group in action	10
Point of an advance guard	11
Point of a rear guard	12
Connecting group	13
Outguard	14

9. Providing flank protection on the march.—*a.* A squad or half squad may often be called upon to act as a flank patrol for a unit on the march. (See pl. 31.)

b. The leader will be given orders either to go to a definite point and rejoin the column or to march along a certain route.

c. This kind of patrol is sent out to reconnoiter dangerous places, such as woods or hills. The formation of the patrol must provide protection and permit at least one man to get away with information if the patrol is defeated. (See pl. 31.)

d. When marching beside a unit the patrol moves rapidly from point to point. Positions which might permit good observation by the enemy on and near the route of the patrol are reconnoitered.

The patrol must reach points dangerous to the column it is protecting in time to prevent the enemy from firing into the column.

e. Usually contact will be kept by men sent out from the column.

f. The enemy is reported by signal. Unless they are moving away from the unit, hostile patrols within effective range are immediately attacked *by fire.* The presence of large bodies is reported by signal and messenger.

g. If, while the patrol is still out, the enemy opens fire either on the column or on the patrol, every effort must be made to locate his flanks quickly and to learn his strength. This information is sent at once to the leader of the group from which the patrol was detailed.

h. While getting this information, the patrol usually avoids a fight, if possible. When necessary, it scatters and, working from different directions, seeks in groups of two or three men to reconnoiter the enemy position.

i. After information has been sent to the platoon leader the patrol remains as protection on the flank of the platoon.

j. It resists to the last man an enemy attack on the column from its flank.

PLATE 31.—Squad in patrol formation to a flank

PROBLEM No. 5

Your squad was sent from your platoon, marching along the road A—B, to reconnoiter the high ground C. When you reach C, four men are on the road at D, followed at 300 yards by about 30 men in column of files on either side of the road.

What do you do?

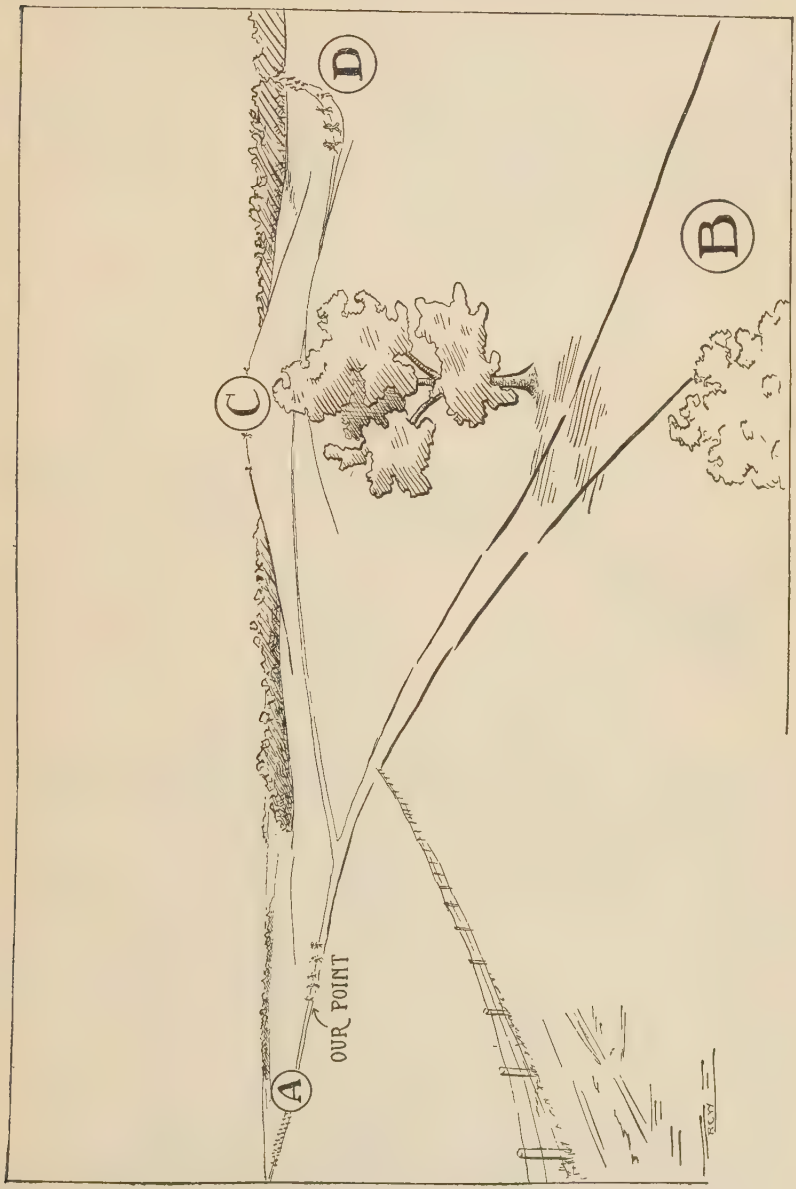


PLATE 32

10. Flank combat group in action.—*a.* During a fight, the squad or half squad may be sent to a flank of a unit for protection of that flank.

b. The unit may be told to go to a certain place, or simply to move out as a flank combat patrol.

c. In either case, the leader marches the group so that it is protected to front and flanks and has a get-away man.

d. If the group is to remain for a time at one locality, the leader requires each man to select two positions, one for firing to the front or flank and one to the flank or rear.

The half squad places one man to observe. The squad usually employs two men. A third man watches for signals from the unit whose flank is being protected. The remainder of the group remains at hand under cover, ready to go immediately to the firing positions which have already been selected and tried out.

e. If the group is not ordered to a definite place, the leader chooses a position or, if the unit from which the group is sent moves forward, a route for it to follow.

f. The position should be one from which the enemy can be held, or due warning given the friendly troops if he attacks the flank. It may be 100 to 500 yards from the troops.

g. The group must be in constant communication with the unit from which it was detailed.

PLATE 33.—Squad as a combat group on the left flank

h. If the troops to be protected are going forward, the group moves rapidly from one position to another. The leader must decide when he will leave one position and go to the next. No guide can be given. His mission is to protect the flank. He must base his decision on his mission, what he knows of conditions, and his judgment.

11. Point of an advance guard.—*a. Description.*—(1) The infantry *point* is the name given to the few infantrymen farthest to the front in a column on the march.

(2) The purpose of the point is to give warning of the presence of the enemy to the troops in rear. Carrying out such purpose prevents the enemy from firing on our troops in close formation and enables them to prepare for the attack.

(3) The squad may be called upon to act as point.

(4) In his orders, the squad leader will be told how far ahead of the other troops he is to start.

b. Formation.—(1) The formation of the point must be such that it will—

(*a*) Offer a poor target.

(*b*) Be prepared to fire quickly to the front or to either flank.

(*c*) Be under control of the squad leader.

(2) The point fires at once on all enemy patrols within effective range. If outside of effective range, it signals "Enemy in sight in small numbers," and continues the advance. When large bodies of the enemy are seen, it signals "Enemy in sight in large numbers." The point pushes on until enemy fire forces it to halt. When the troops in rear of the point are forced by fire to stop, the point, acting as a patrol, makes every effort to locate the flanks and determine the size of the resistance. (See par. 10.)

(3) Except to open fire, the point stops only when ordered or signaled from the rear to halt.

c. Connecting files.—(1) Men called connecting files are sent forward from the troops in rear to keep contact with the point.

(2) The connecting files pass forward all orders and messages received from the rear. They halt only on orders or signals from the rear, or when the point halts. They pass back no signals except "Enemy in sight in small numbers," "Enemy in sight in large numbers," and special signals previously agreed upon.

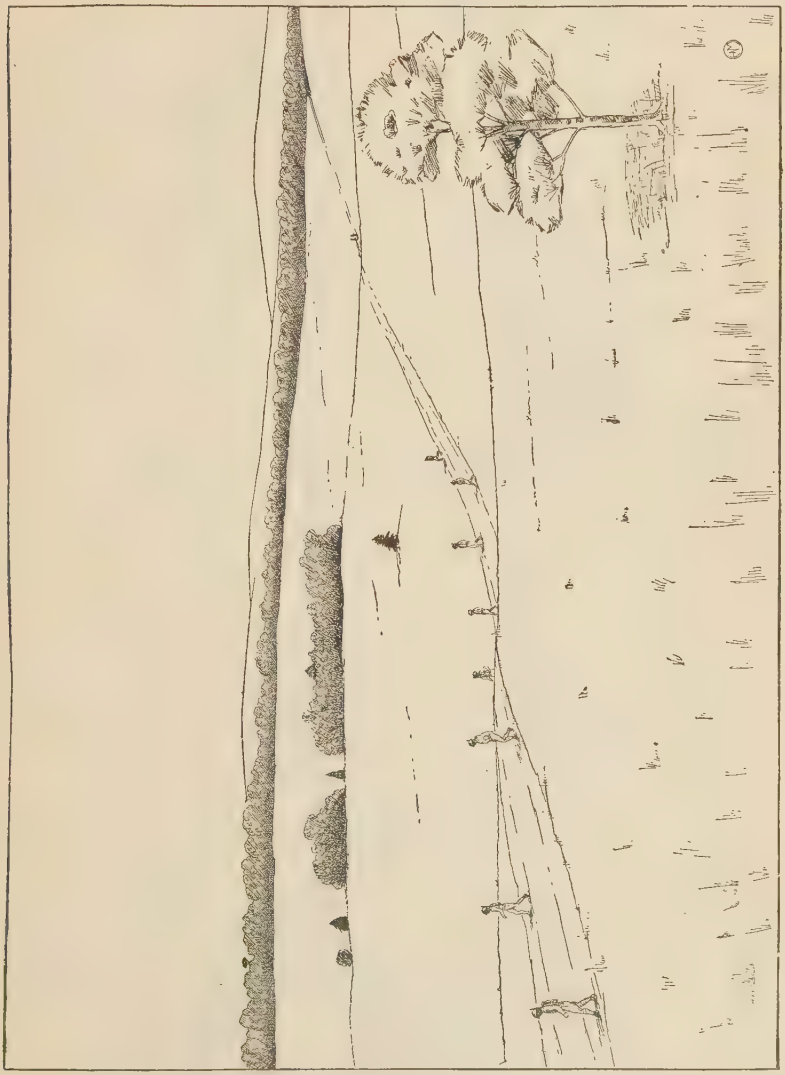


PLATE 34.—Advance guard point and connecting files

(3) If each connecting file consists of one man instead of two, as shown in the above sketch, he looks alternately to the rear and to the front for signals. When the connecting file is two men, one man looks to the rear for signals, the other to the front.

(4) Each connecting file moves so as to be able when looking forward to see the file or group ahead, and when looking to the rear, the file or group to the rear. To do so he may have to double time 30 or 40 yards, or halt several seconds. The connecting file marches at other times so as to keep his proper distance.

PROBLEM No. 6

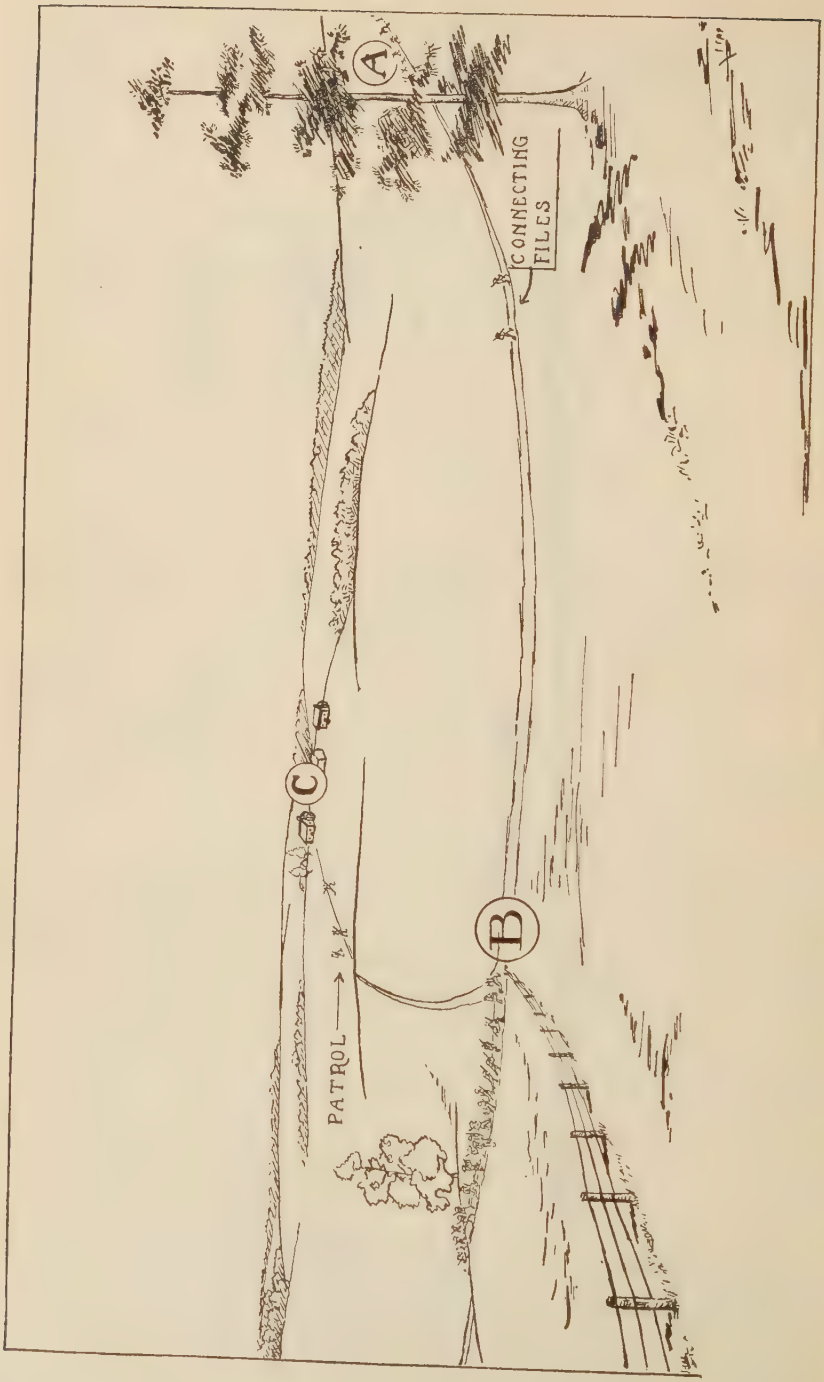


PLATE 35

Your squad is the point of an advance guard marching along the road B–A. When you reach A, heavy fire from the houses at C is opened on the advance party at B.

What do you do? (Pl. 35.)

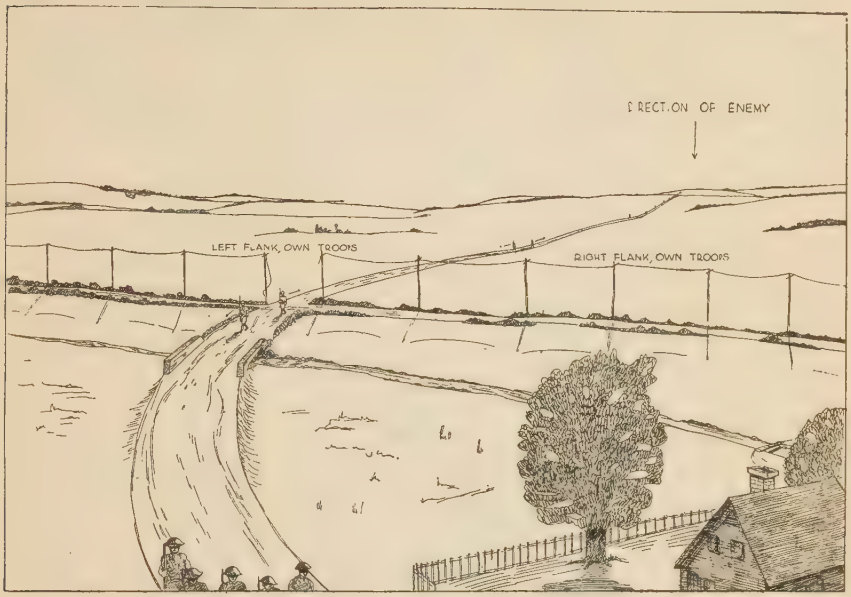


PLATE 36.—Right flank and left flank of troops on march away from the enemy

PLATE 37.—Rear point falling back around flank of supporting troops

12. Point of a rear guard.—*a. Description.*—(1) The *rear point* or *rear guard point* is the name given to the few infantrymen farthest to the rear in a column on the march.

(2) The squad or half squad may be called upon to act as rear point.

(3) Front in all cases is the direction of the enemy. When marching away from the enemy, the front is opposite the direction of march.

The right flank is always to the right when facing toward the enemy. Thus, in a retreat, the right flank would be on the left-hand side of the column.

(4) The purpose of the rear point is to give the next larger unit warning of the presence of the enemy and to prevent him from delaying the column.

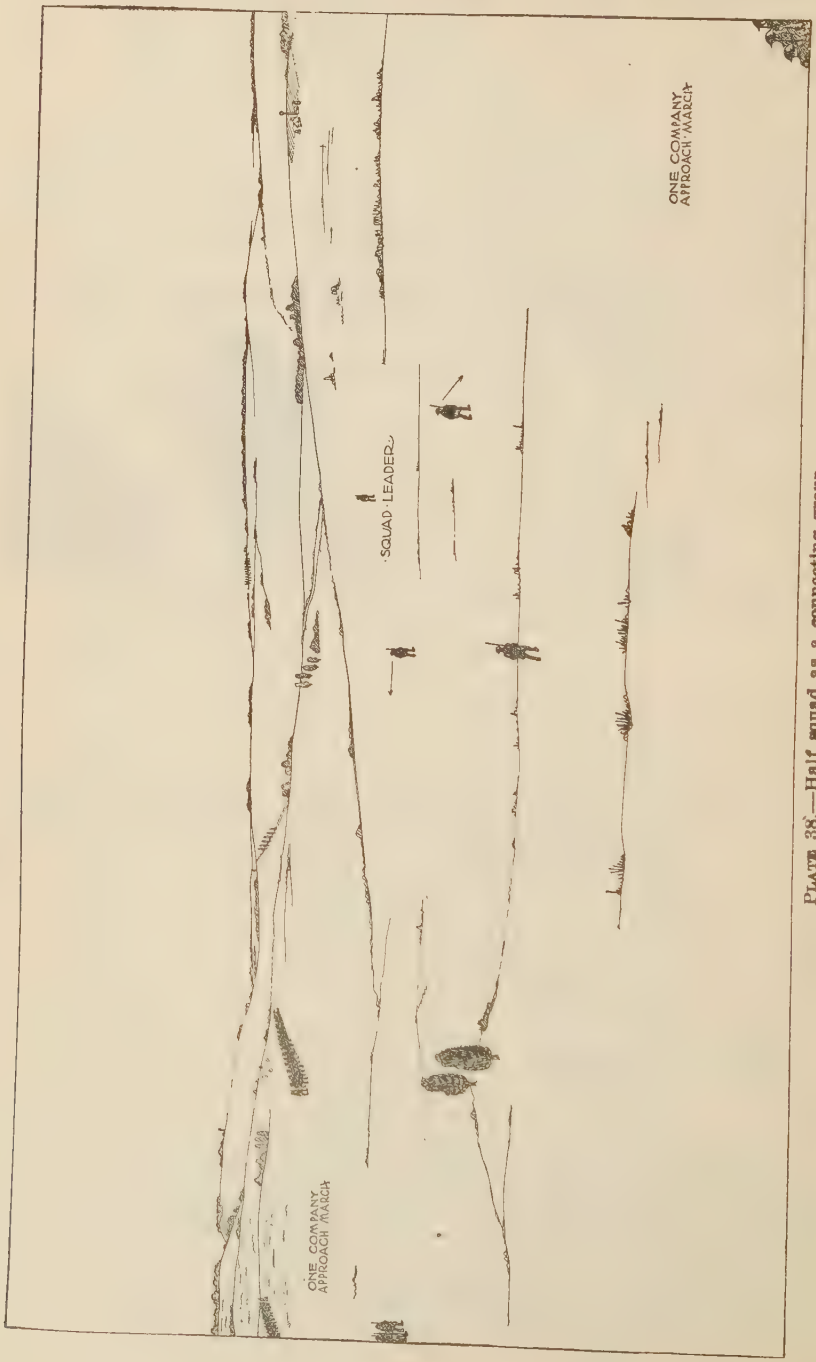


PLATE 38.—Half squad as a connecting group

(5) In his orders, the squad leader will be told how far behind the other troops he is to start.

b. Formation.—The formation of the rear point is similar to that for a point of an advance guard. (See par. 11.) At least one man must at all times be watching to the rear.

c. The rear point stops to fire only when the enemy compels it to do so. The enemy's presence is at once reported by signal. (See par. 11.)

d. The rear point can expect no assistance from other troops. If the enemy is in large numbers, the other troops may take up a position farther to the rear. In this case, the rear point, when forced back must withdraw to a flank instead of straight to the rear. (See pl. 37, dotted lines.)

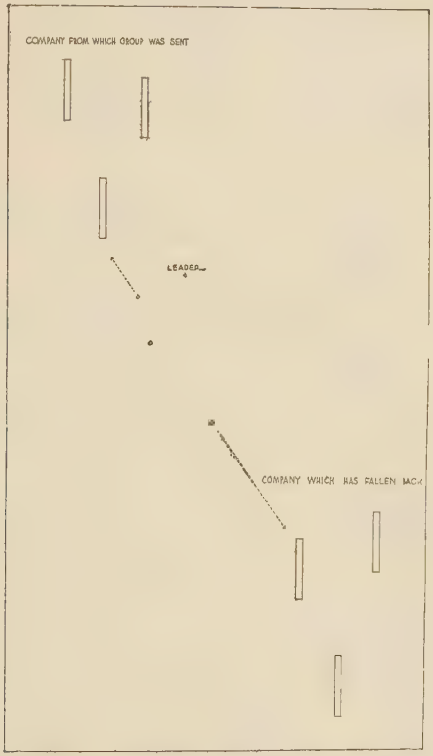


PLATE 39.—Half squad as a connecting group, showing a method of keeping connection where one company has fallen back

e. Connecting files.—Connecting files dropped back from the other troops keep contact with the rear point. These connecting files pass forward all orders and signals received from the rear. They halt only on orders or signal from the rear. They pass to the rear no signals except "Enemy in sight in small numbers," "Enemy in sight in large numbers," and special signals previously agreed upon.

13. Connecting group.—*a. Description.*—A half squad or squad sent to the flank of a company or platoon to keep contact with the unit on that flank, is called a connecting group. (See pl. 39.)

b. It should move in such manner that it knows at all times the location of each unit with which it is keeping contact. At one moment from a rise in the ground it may see one company and not the other. By having a man climb a tree it may see both at the same time.

c. If one company falls behind, the connecting group drops back to maintain contact.

d. In this case, close touch must be kept with the company from which it was sent.

e. If contact with the other company is lost, immediate report of the fact is made by runner to the company commander of the company from which the group was detailed.

f. Unless ordered in, the group remains out to protect the flank. It thus automatically becomes a combat patrol.

g. While contact is being kept the connecting group does not fight except for self-protection or to give warning of a flank attack by the enemy.

Problem No. 7

Your squad at A is the connecting group sent out from your company at B for the purpose of keeping contact with the company at C.

How will you perform such duty while the companies are passing the woods D?

Plate 40

14. Outguard.—*a.* When troops halt for several hours, part of the command is placed so as to protect the remainder. These protecting troops are called the *outpost.*

The outpost is divided as shown in Plate 41.

b. The reserve sends out the supports, and the supports in turn place small groups to their front to keep the enemy from surprising them. These groups are called *outguards.* (See pl. 42.)

c. A squad when on this duty as a unit is called a *sentry squad.* When it is divided so that half of the squad is on duty at one point and the other half at another, each is called a *cossack post.* (See pl. 43.)

d. A sentry squad posts three reliefs of one or two sentinels each.

e. A cossack post posts only one sentinel for each of the three reliefs.

f. Supports and outguards are numbered from right to left.

g. The posts of the outguard and the number of sentinels will be given in orders. The leader of the outguard will select the posts for the sentinels.

h. The posts of sentinels must be such that they can from cover—

(1) See the ground in front and to the flanks of the outguard.

(2) Be easily approached under cover from the rear.

i. At night it may be necessary to change the positions of the sentinels. The posts are chosen to cover possible avenues of approach in the outguard sector.

j. Members of the outguard not posted as sentinels rest near by under cover.

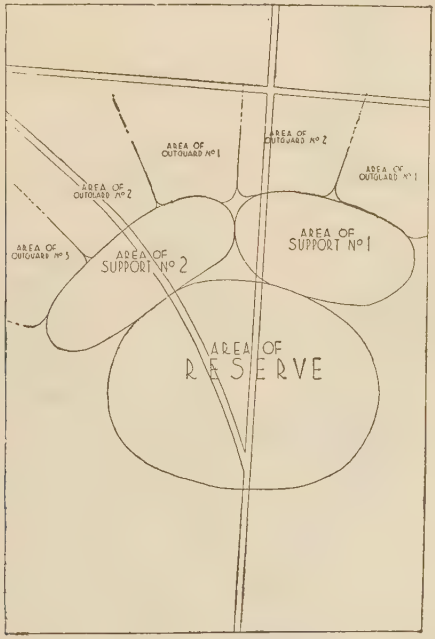


PLATE 41.—Subdivisions of an outpost

k. Sentinels are given the following information:

(1) As to enemy:

(*a*) Direction.

(*b*) Probable routes of approach.

(*c*) Special sector to watch.

(2) As to own troops:

(*a*) Location of the support and outguards to the right and left. Number of his relief. Number of the outguard and number of the support. When asked by an officer or petty officer who he is, the sentinel gives the above information as follows: "Sentinel No. —, Outguard No. —, Support No. —."

(*b*) Any patrols which have gone out.

(*c*) Place where prisoners are to be taken. Place where messages are to be sent.

(3) Special signals, such as gas alarm, barrage, and countersigns.

(4) Names of features of military importance, such as roads, villages, or streams.

l. During the day, outguards are placed to *see;* at night to *listen.* All talking at night must be in whispers.

m. The outguard commander will be told in orders what to do in case the enemy attacks. If his orders state that he is to resist, he selects positions for his riflemen and automatic riflemen. Alternate positions for the latter are also chosen.

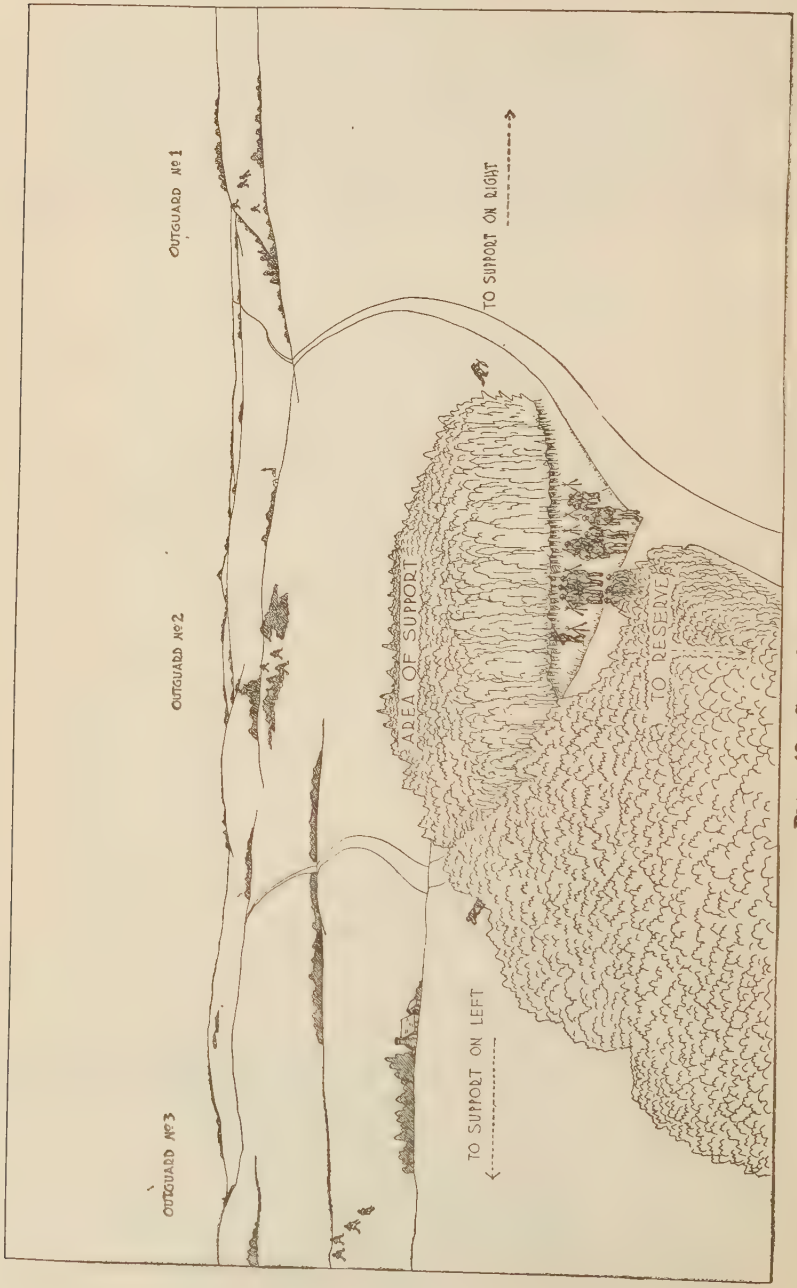


PLATE 42.—Several outguards on duty

PLATE 43.—Cossack post on duty

PLATE 44.—Sentry squad on duty

Section III.—ESTIMATE OF THE SITUATION, ORDERS, AND MESSAGES

	Paragraph
Estimate of the situation	15
Orders	16
Messages	17

15. Estimate of the situation.—*a. Description.*—When the squad leader is given a job to do, there are certain things he should think about before beginning work.

In a fight, unless he follows some system, he may not take into account everything that he should before starting to carry out his orders.

b. Estimate for the squad.—When the squad is acting alone or is lost to control of the section leader, the squad leader often has to consider all of the steps given in *the estimate.* When the leader is under control of the section leader, however, there may be only two or three points that the squad leader must consider.

c. Form for estimate of the situation.—(1) What is *my job?* What am I to do?

(2) What about *the enemy?* Where is he? How strong is he? What is the range? What is the worst thing the enemy can do to prevent me from carrying out my job?

(3) What about my *own troops?* How many men have I? Where is the squad on my right? On my left? Where is the platoon on my right? On my left? Where is the rest of my platoon? What are they doing? What weapons have I?

(4) What about *the ground?* Where is a good fire position for my squad? What cover is there on my flanks? To my front?

(5) What are *the ways in which I can do my job?* What are the good and bad points of each?

(6) Which is *the best way?*

d. The squad leader shall commit to memory and always use the form:

(1) *My job?*
(2) *The enemy?*
(3) *Own troops?*
(4) *The ground?*
(5) *The ways in which I can do my job?*
(6) *The best way?*

e. In an attack you were told to take your squad to A and protect the flank of the assault platoons which have been held up and are fighting at B. (See pl. 45.)

PLATE 45

When you reach A, you see nothing of the enemy in the direction of D or E. A friendly platoon at C has halted and seems to be taking cover from enemy fire. Required: Your *estimate of the situation.*

(NOTE.—You now have a *job* (mission) which will require you to make an important *decision.* You must think of *everything, decide what you will do,* and then *tell each man what his job is,* so that he can not make a mistake in doing it.)

Using the form in paragraph *d,* we have as the *estimate of the situation*—

(1) Our squad is to protect this flank of the assault platoons of the company. (*Job.*)

(2) I can see nothing of *the enemy,* but he is probably in those woods, D.

(3) The company is held up over there—B; the platoon over to the left, C, seems to be under fire. (*Own troops.*)

(4) *The ground* is level and bare between this point and the woods, D; to the front, E, it is broken. Small folds here, A, afford good firing positions and good cover for the squad.

(5) *The ways in which I can do my job.*

(*a*) I can deploy the squad and take a firing position to face the woods, D. If the enemy advances from there, I will be ready for him. He may, however, come from the front, E, and I would then have to change the position of the squad.

(*b*) I can deploy part of the squad to face the woods, D, and part to face the front, E. I will then have fire on him if he comes from either direction. But when he appears I want to be able to bring on him quickly the fire of the whole squad. To do so, I would have to shift half of the squad. All men would be on duty all of the time.

(*c*) I can have all men select firing positions facing the woods, D, and the front, E, then detail two men as observers while the others stay under cover ready to take their positions for firing toward either point. The observers will see the enemy if he leaves cover. While two men are on duty watching, the others are resting. All men can be quickly placed so as to face in any direction. This plan has no disadvantages.

(6) I decide *the best way* is (*c*).

f. Example of a partial estimate.—(1) Usually the estimate for a leader in combat will be very short. If he has followed in his training the form given in paragraph *d,* he should in battle leave out nothing that ought to be considered. Constant practice will teach him what to think about and how to think quickly.

(2) The following is given as a partial estimate. It does not refer to any situation given.

"We are to attack. There are machine rifles firing at us from that field. The scouts are in that grass. There is no cover to use in getting to the line We'll go up one at a time."

(3) The trained leader thinks this in less than half the time it takes to read it. But he should think it before he decides what to do.

16. Orders.—*a.* When the best way has been decided upon, when a plan has been made, all men must be told everything they need to know in order to have them assist intelligently in carrying out the plan.

b. When it is desired to have a thing done, say so definitely. For example: "Smith, watch to that flank" [pointing to it], not "Smith, suppose you look over that way."

c. Orders will be carried out well only when they are clear and definite.

d. To be certain that nothing is left out of the order, this form should be followed:

(1) Tell the men all you know about the *enemy.*

(2) Tell them all you know about your *own troops* that they do not know.

(3) Tell them what *your plan* is, and what the squad is to do.

(4) *Tell each man what he is to do.*—If all are to do the same thing, there is no need to tell each one separately. For example: If the squad is to move up a ravine in squad column, tell the whole squad, "We are going up that ravine" [pointing to it].

(5) *Where you are going to be.*—When you are to be at a distance from men in your squad tell them exactly where you are to be. For example: "I will be behind that mound" [pointing to it].

e. Suppose in the problem in paragraph 15, subparagraph *e*, you make the estimate of the situation which follows it. *A plan of action* has now been decided upon. All men must be told everything they need to know in order to have them assist intelligently in carrying out *the plan.* The leader should call all men close to him, so that they can hear, be under cover, and see D. He should then issue an order about as follows:

"(1) I believe *the enemy* is in those woods, D [pointing it out]. (2) Our company [*own troops*] is over there, B [pointing it out]. A platoon of the company on our left is down in that draw, C [pointing it out]. (3) We are

To				
Sent	DATE / /	HOUR .M.	How Sent	Message Center Serial Number
No.—				
From				
Rec'd	Date / /	Hour .M.		Message Center Serial Number

PLATE 46.—Field message blank

going to stay here to protect this flank of the company. We will get firing positions so as to cover the ground toward the woods, D [pointing it out]; then get positions to cover the front, E [pointing it out]. [*Plan of action.*] (4) [After the above has been done] Jones and Smith go on duty as observers. Jones, watch from that house, E, around to the company; Smith, from the house, E, around to the platoon, C. The rest of the squad stay here under cover. Brown, you watch toward the company for signals. (5) I'll be here."

The leader then directs each man to select his position.

f. Usually the order will be much shorter. Suppose the leader made the estimate given in paragraph 15 *f*, then his order might be:

"Machine rifles are firing at us from that wheat field. The scouts are in the grass 200 years ahead. We are going to build up the line of scouts and attack those machine rifles. Henry [automatic rifleman], go first; Guy [substitute automatic rifleman], next. I'll follow Guy. Jones [second in command], send the other men up after me. You follow them."

17. Messages.—*a. Written messages.*—(1) Except when acting as a patrol or an outguard, the squad will rarely send written messages.

(2) The following plate shows a field message blank.

(3) After "To" is stated the title of the commander of the unit to which the message is sent, as—

To CO 1st Plat.

(4) Under "Date" is stated the day of the month, month of the year, and year, as—

11 Dec. 22.

(5) Under "Hour" is given the hour the message is actually signed, as—

8.30 a. m.
9.20 a. m.

(6) Place "a" before "m" if the message is written in the morning. If it is written after noon, place "p" before "m."

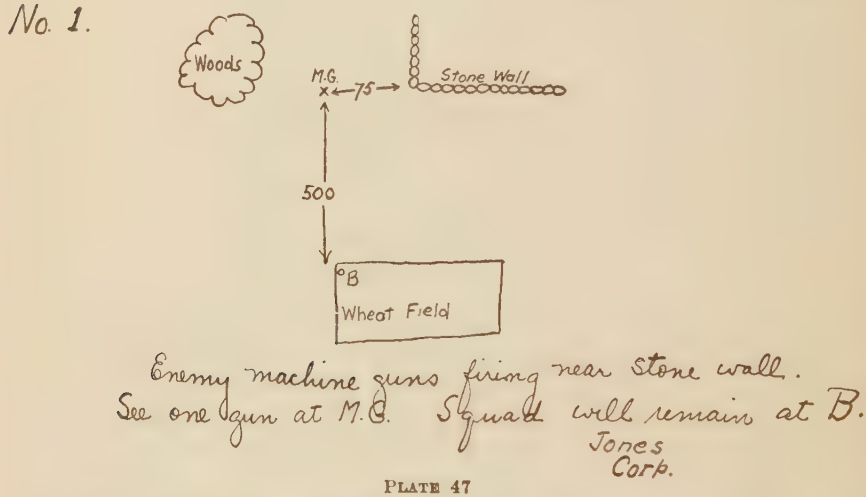


PLATE 47

(7) Under "How Sent" state the means used to send the message, such as runner or bicyclist.

(8) Nothing is entered under the heading "Message Center Serial Number."

(9) After "No." is stated the number of the message. If one message has already been sent, the next is numbered 2. If two have been sent, the next is numbered 3.

(10) Under "From" is placed the title of the unit from which the message is sent, as—

From Patrol No. 1.
From Outguard No. 1.
From 2d squad, 1st plat.

(11) The signature follows the matter written by the squad leader. The last name only is signed to the message and this shall be followed by the rank of the sender, as—

Kane, Pvt.

(12) The rest of the blank is not used by the squad leader in writing the message.

(13) Messages must be brief and clear like telegrams.

(14) Facts known to be true should be stated as such. For example, "Saw enemy patrol, seven men, enter COLUMBUS from west at 5 p. m."

(15) If one of the men had said that he saw this happen, it should be stated in the message as follows: "Pvt. Smith said *he saw* enemy patrol, seven men, enter COLUMBUS from west at 5 p. m."

(16) Write distinctly. Print all words if possible and time permits.

(17) Names of such features as villages, towns, roads, and rivers are capitalized. For example: MACON (city), MARNE (river), DIXIE HIGHWAY (road). When the road is named by using two or more towns, cities, etc., on it, the names are given with a dash between each two, as—

The ALBANY–MACON ROAD.
The COLUMBUS–NEWMAN–ATLANTA ROAD.

(18) Example of message to company commander:

The leader then points out to the runner who will carry the message, the locality of the stone wall, woods, and machine gun.

(NOTE.—The above sketch is not drawn to scale. It requires no special training on the part of the squad leader. It contains no unnecessary information. It gives all the information that is needed. It can be quickly made.)

PROBLEM No. 8

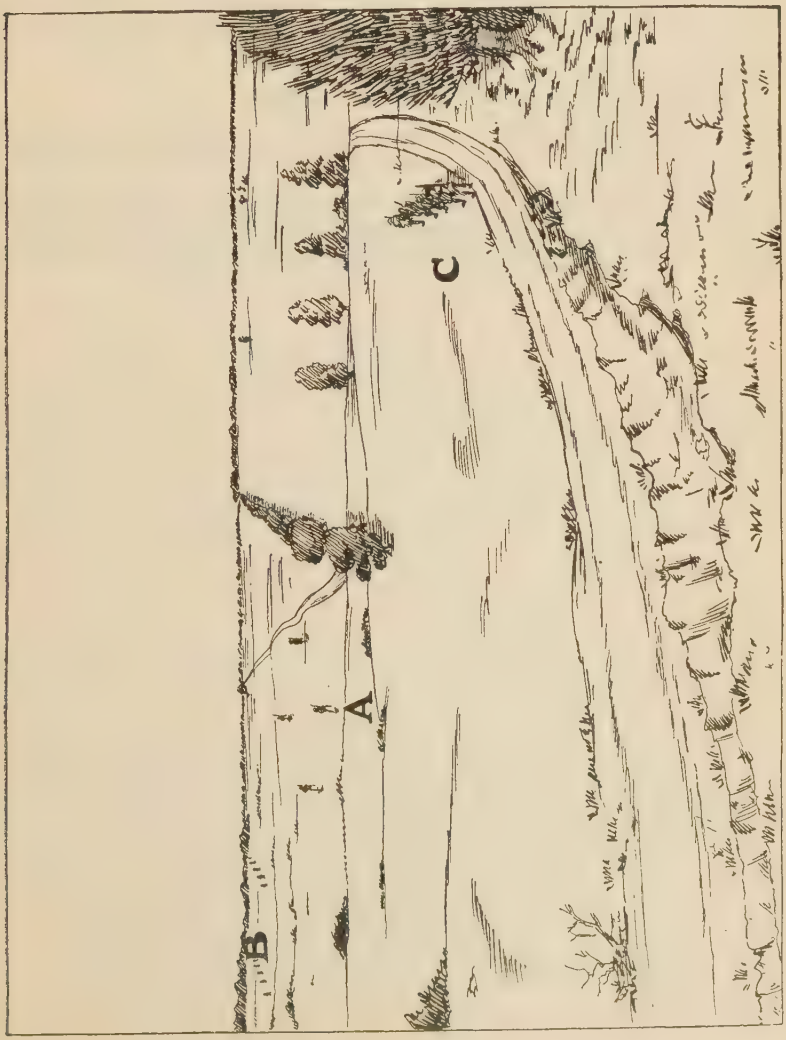


PLATE 48

Your squad at A is connecting group sent from your company at B to keep contact with the company at C. The company at C has been held up. In a few moments you must push on in order to keep contact with your own company. When you do move, you will lose touch with the company at C. You decide to send a message to your company commander telling him about the situation. So far you have sent him no message. (Pl. 48.)

Write the message.

b. Verbal messages.—(1) Often when a message must be sent, there is not time to write it out. In such cases if signals can not be used, the message should be sent verbally.

(2) A verbal message should contain but one thought or idea. Example: "The enemy is withdrawing."

(3) Negative statements should not be made. In the following message, if the word "not" is left out, the whole meaning is changed. "I will *not* be back before dark." A postive statement is always best. "I will be back after dark," is a positive statement.

(4) The runner should know—

(*a*) Whom the message is from, and

(*b*) To whom it is going.

(5) The runner is required to repeat the message before he leaves. He should be told whether to return or to remain with the person to whom the message will go.

(6) Example of a complete verbal message:

"From Coxswain Smith. To section leader.
Have lost four men."

(7) When passing an order or message along the firing line, the name of the person who first gave it should be stated. For example: "Coxswain Jones says 'Cease firing.'"

(8) When to send a message: When in doubt as to whether a message should be sent or not, the leader must imagine that he is the person who is to receive it. If in this case he would want to have the information, then a message ought to be sent.

TRAINING REGULATIONS, NO. 420-110

INFANTRY

Combat Principles—The Rifle Section

		Paragraphs
SECTION I.	Organization and route march	1–2
II.	Section in attack	3–7
III.	Section in defense	8–10
IV.	Night operations	11–15
V.	Security on the march	16–19
VI.	Security at rest	20–24
VII.	Flank combat group	25

Section I.—ORGANIZATION AND ROUTE MARCH

	Paragraph
Organization	1
Route march	2

1. Organization.—*a.* A section is a half platoon. It consists of a section headquarters and three squads.

(1) Section headquarters consists of—

1 first petty officer, section leader, and platoon guide.
1 petty officer, section guide.

(2) Each squad consists of—

1 third class petty officer, squad leader.
7 seamen, first and second class.

b. Section leaders command their sections and carry out the orders of all officers and of noncommissioned officers senior in rank.

2. Route march.—*a. Position of section in column.*—During the route march the section marches in its designated place in the platoon. The section leader is a platoon guide. The section guide marches with other file closers in an extra rank at the rear of the platoon.

b. March discipline.—All petty officers with the section strictly enforce discipline while on the march. Straggling must be severely checked. Men are kept closed up to proper distances at all times.

Section II.—SECTION IN ATTACK

	Paragraph
Approach march	3
Action of leader when he receives orders to attack	4
The attack	5
The assault	6
Reorganization	7

3. Approach march.—*a. Formations.*—The initial formation for the approach march will be ordered by the platoon leader. Section leaders may change the formations of their sections to suit conditions without waiting for orders from platoon headquarters. They are authorized, however, to make only such changes as are necessary to assist the advance or for protection of the sections. The following are types of formations which will be found of greatest use:

(1) Squad columns may be used (see pl. 49)—

(*a*) In avoiding small, heavily shelled areas.
(*b*) Going through ordinary shelling.
(*c*) Over open ground not under fire.
(*d*) Through small-arms fire not aimed at the platoon.
(*e*) Through woods, fog, or smoke.

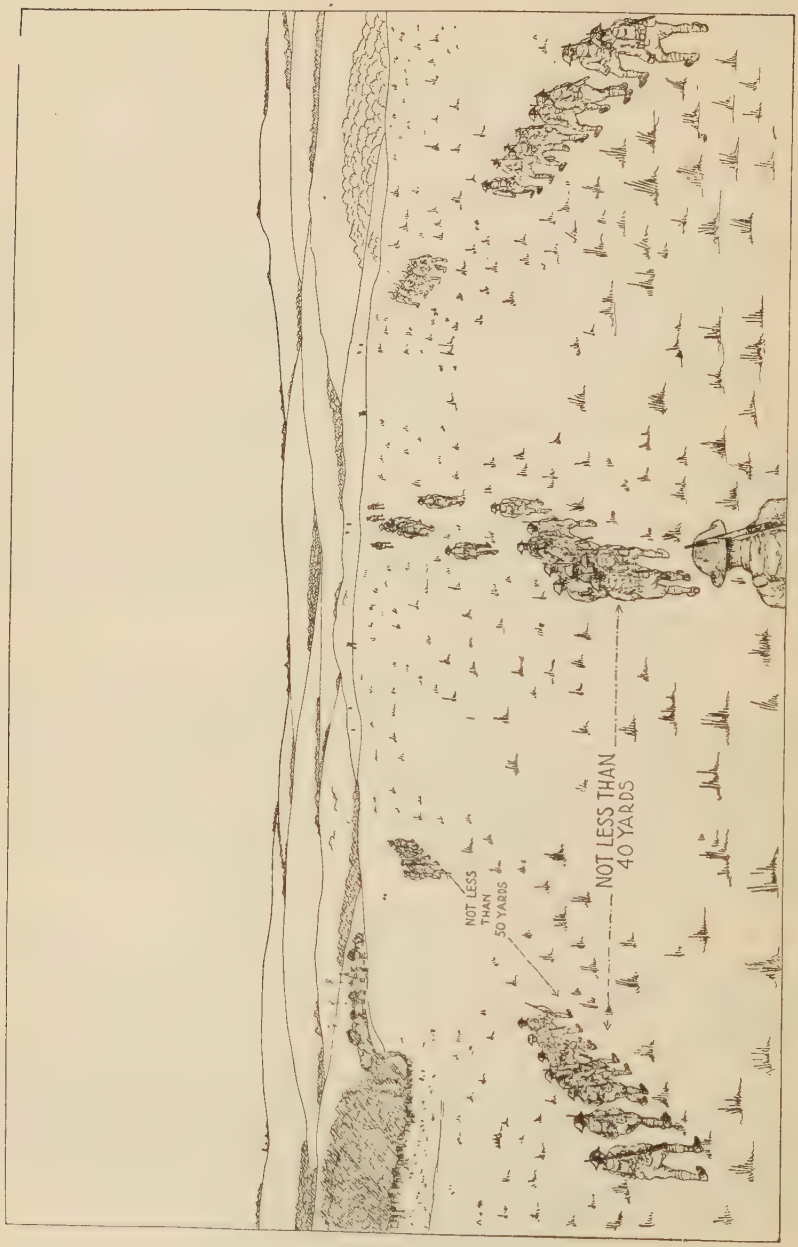


PLATE 49.—Platoon in squad columns in approach march

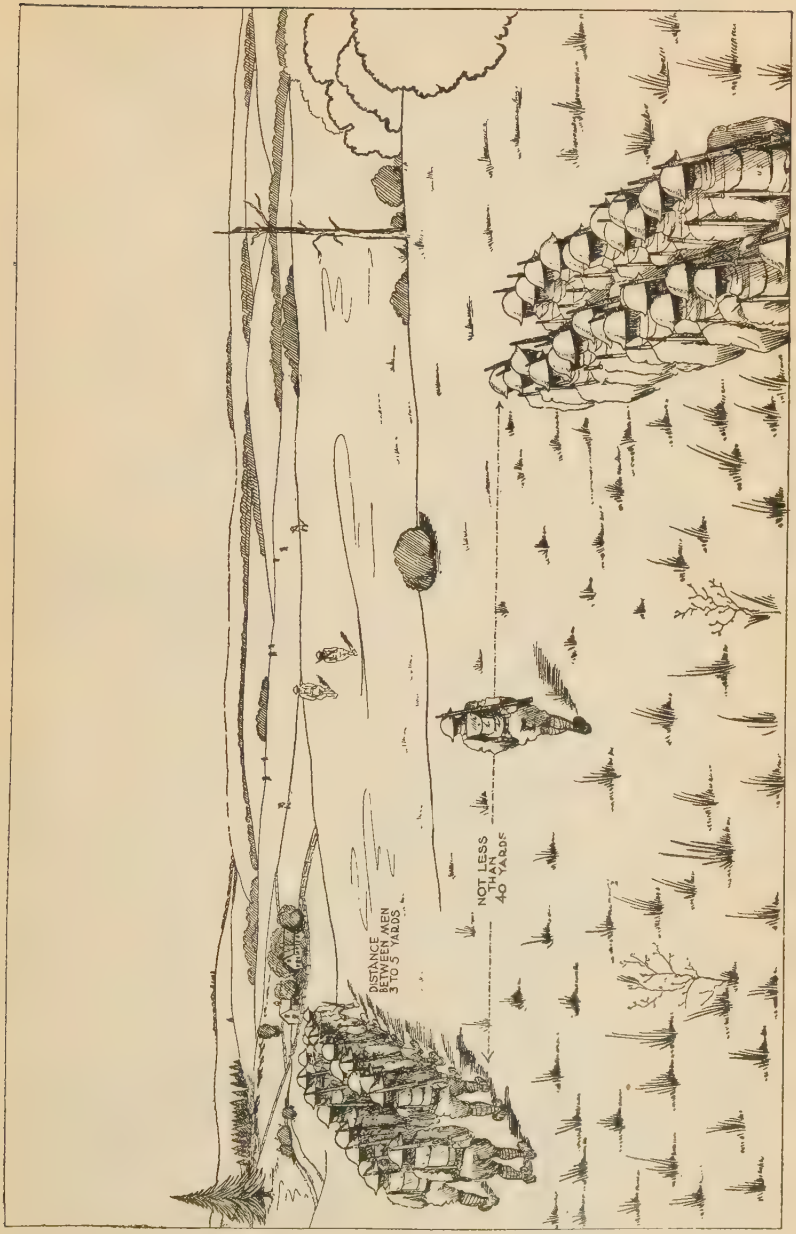


PLATE 50.—Platoon in section columns in approach march

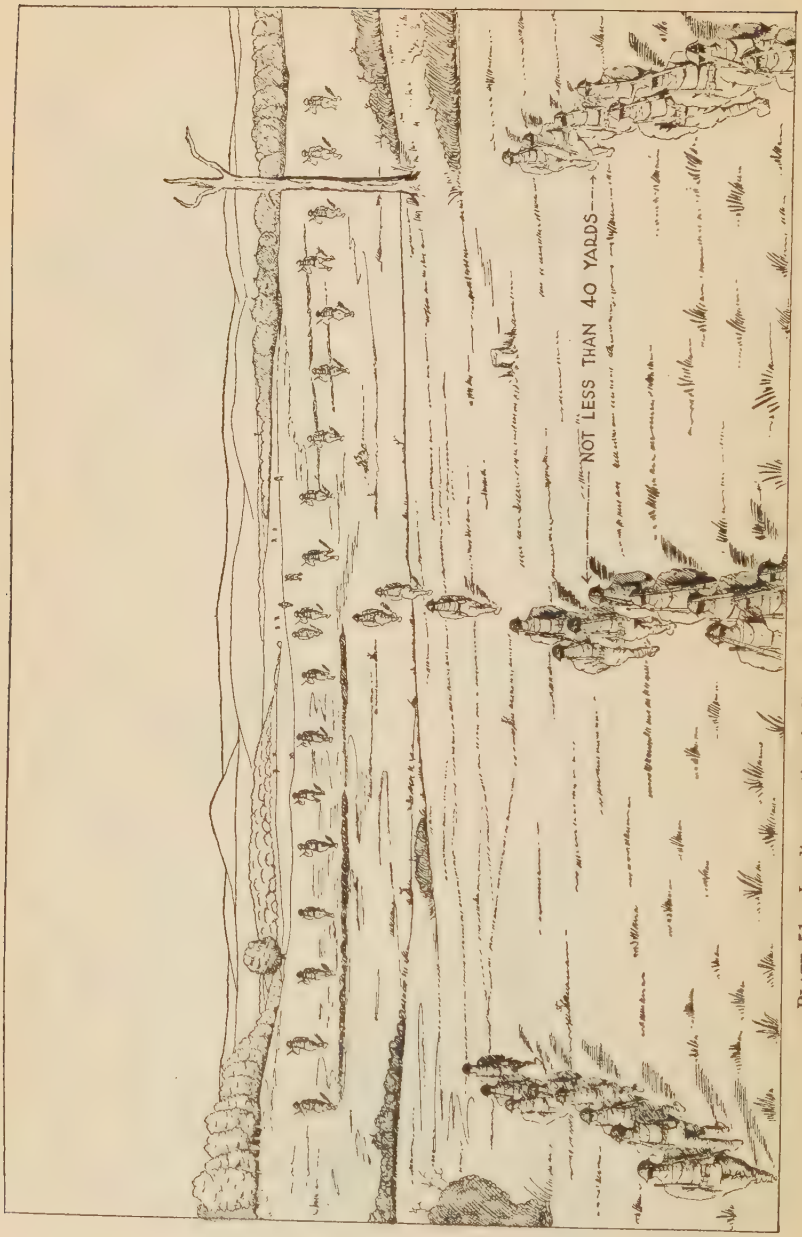


PLATE 51.—Leading section in line of skirmishers, rear section in squad columns

The rear section may be in section column.

(2) If a heavily shelled area must be crossed, the section, in the absence of orders from platoon headquarters, is ordered to reform at a designated place or on a designated line beyond the area, and squad leaders work their squads over independently. On arrival at the place or line the section is immediately reformed and the advance continued.

(3) Section columns may be used (see pl. 50)—

(*a*) In avoiding small, heavily shelled areas.
(*b*) Going through ordinary shelling.
(*c*) Over open ground not under fire.
(*d*) Through woods, fog, or smoke.

This formation gives better control than squad columns. The rear section may be echeloned to the left of the leading section instead of to the right, as in Plate 2. Section columns are not so suitable for meeting a surprise attack in the open as squad columns.

(4) Leading section in line of skirmishers while the rear section is in section or squad columns may be used (see pl. 51.)—

(*a*) In crossing open spaces when the enemy is near.
(*b*) In approaching probable enemy positions.

The rear section may be placed in section column instead of squad columns when the situation demands, or it, too, may be in line of skirmishers.

(5) Under small-arms fire aimed at the platoon from the right or left front, troops must advance by bounds from cover to cover, by rushes of small groups or by infiltration, until such time as a farther advance becomes impossible except under cover of fire.

(6) *Under long-range machine-gun fire.*—Under long-range machine-gun fire directed at the area being crossed, the sections advance by successive lines of men at wide intervals or by bounds from cover to cover.

(7) *Crossing a ridge.*—For crossing a ridge line being heavily shelled or on which it is known the enemy artillery has registered, thin lines are generally used. Each line is rushed across the crest to cover and there reorganized.

(8) *Passing through woods.*—In a passage through woods, distances and intervals are decreased. If the woods are thick, section columns should be formed. As visibility decreases, control becomes more difficult.

Situation No. 1.—Your platoon is moving forward in the approach march. You are leader of the first section. When you left B, the section was in squad columns. When you reach A, your platoon leader is out of sight to the front. Heavy shelling of the crossroads and houses at C commences.

Requirement.—How are you going to pass the area under fire at C? (Pl. 52.)

Situation No. 2.—When the platoon reached D, the enemy began a general shelling of the crest beyond.

Requirement.—If you have no orders from the platoon leader, what formation will you use to pass through this fire? Why?

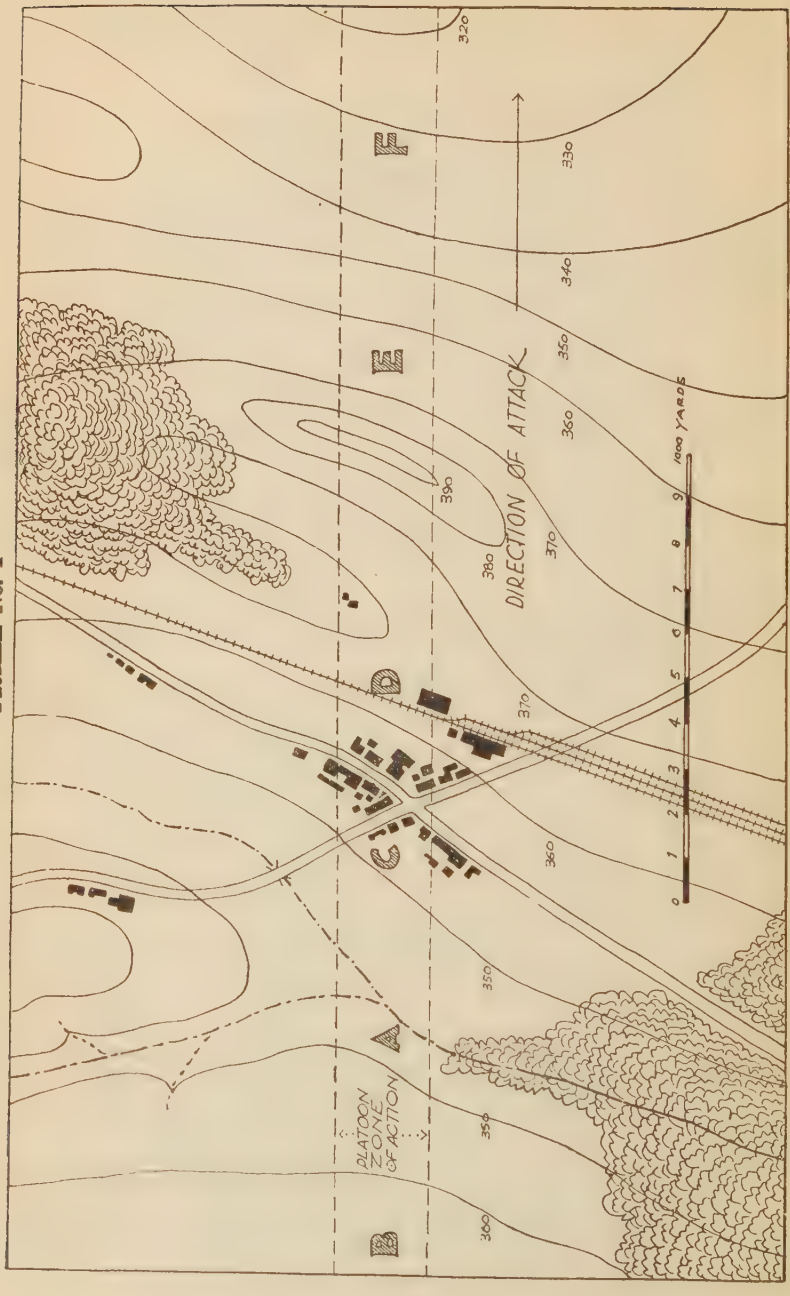
Situation No. 3.—As your section reaches E, machine-gun firing from what you think is 1,000 to 1,500 yards opens on your section from the left front. Your scouts are about 500 yards to your front at F. The platoon leader is about 200 yards ahead.

Requirement.—What do you do? Why?

b. Position of section leader.—(1) In the approach march, the section leader marches ahead of his section. He looks back only when necessary to exercise control or to order changes in formations. The section leader of the leading section watches the platoon leader for signals. The leader of the rear section looks to the platoon sergeant for signals and for orders.

If the platoon chief petty officer is not between the leading and rear sections, the leader of the rear section conforms to the movement of the leading section. Responsibility for keeping touch with the leading section is at all times with the leader of the rear section. When in woods or fog where visibility is low, he either lessens the distance or sends forward connecting files.

Except when ordered to do so, the leader of the rear section at no time permits his section to become merged with the leading section.



PROBLEM No. 1

PLATE 52

(2) If the platoon is halted in a position where hostile fire may be expected, section leaders place their sections under cover, or if no cover is available, cause the men to lie down.

(3) During halts, section leaders study the ground to their front with a view to locating cover from fire.

(4) Section leaders control their squads through the squad leaders. They issue orders to the squad leaders and see that they are carried out.

c. Section guide.—The section guide marches in rear of his section. In the absence of his section leader he takes command. His duties are—

(1) To carry out the orders of all officers and ranking petty officers.

(2) To replace the section leader should he become a casualty.

(3) To require the second in command of each squad to keep men in ranks and closed up.

4. Action of leader when he receives orders to attack.—*a.* Upon receipt of his orders to attack, the section leader quickly estimates the situation, assembles his squad leaders, and issues his orders.

If the target can be seen from cover close to the section, the squad leaders should be assembled there. If no cover is available the section leader goes in turn to each squad leader and gives his orders.

This takes time, but a section in which each man knows what he is expected to do will be far more effective than a section fighting without the necessary information.

b. The section leader in giving orders points out the location of the enemy, own scouts, adjacent units, and platoon headquarters. He gives the plan of attack for the platoon—what each section is to do; he states where section headquarters will be; he tells each squad leader what his squad is to do.

c. An example of such an order for the leading section is:

"*The enemy* is 500 yards to our front along that hill. His machine guns are firing from that patch of woods.

"Our scouts are 200 yards ahead in that tall grass. Platoon headquarters is at that green house. The platoon on our left is over about 200 yards. The platoon on our right is working ahead among those buildings. [Own troops.]

"We are going to get those machine guns. [Plan.] The rear section will work around through those woods. This section is going to build up the line of scouts.

"Re-form your squads on the line of scouts and open fire. [What each part is to do.]

"I will be near that mound. [Where you will be.]"

d. The section guide is given his orders at the same time the squad leaders are or, if for any reason this is not practicable, as soon thereafter as is practicable.

e. Responsibility for getting squads on the firing line rests with the squad leaders. The section guide remains in rear of the section to insure that all men enter the fight. He is the last man to go to the firing line.

f. The section leader may go forward to the new line at any time. He usually follows the automatics, but his decision is governed by where he considers his presence is most needed.

5. The attack.—*a. Position of section leader.*—During the attack the section leader is in rear of his section. His position must be one from which he can—

(1) See the enemy.

(2) Control his section.

He is not bound to any one place and moves wherever he is needed. He does not look toward platoon headquarters.

b. The section guide.—(1) The section guide after reaching the line remains where he can see the section leader and all squad leaders and be in touch with platoon headquarters. He should be close enough to the section leader for easy communication by voice.

(2) He moves frequently, if necessary, to insure that all squad leaders are performing their duties. He goes to any leader who is not properly supervising his squad and points out to him the correction or change to be made.

(3) He looks from time to time toward platoon headquarters for signals. He receives from platoon headquarters all signals for the section and tells the section leader of them. He transmits orders or signals of the section leader to squad leaders.

(4) He is responsible for the mechanical functioning of the section while firing. He does not watch the target. The effect of fire, the time to start mov-

ing forward, the size of the units to go, and their route are all matters which concern the section leader.

c. Methods of advance.—(1) Unless orders have been given not to advance, or to advance only upon orders of higher commanders, the section leader moves his section forward whenever the fire of the enemy permits.

(2) The formation for the advance by fire and movement during an attack must be such as to offer a poor target and not materially to reduce the fire of the section.

(3) Advances should be by bounds of small groups, every advantage being taken of the weakness of the hostile fire or favorable conditions of terrain.

(4) Rushes should be short. A bound of less than 20 yards is of little value. On the other hand, to rush more than 40 yards in combat so tires the average soldier that it takes him several minutes to recover.

(5) A new line is established by the first units to go forward. In getting a new firing position, men take advantage of available near-by cover.

(6) No effort is made during the attack to keep a straight line or to maintain intervals between men, except that bunching in the open is avoided. In some cases a squad may become separated from the rest of the section by a mound, a nose, a patch of brush, or similar obstacle.

d. Action of leader of rear section when maneuvering.—(1) The rear section is the maneuver unit of the platoon. The leader, therefore, holds his section in readiness to reinforce the firing line promptly.

(2) When directed to reinforce the firing line, he assembles his squad leaders and issues orders as explained in paragraph 5 *c* (5).

(3) When units become mixed, the senior petty officer will take command.

(4) If the plan of attack provides that one section takes a firing position and drives straight to the front while the other section works closer to a flank of the target, the rear section will usually be called upon to make the flanking move. In this case, or at other times when the section is beyond the direct control of platoon headquarters, the leader will have to take the same precautions and use the same methods that he would if the section was alone.

(5) The leader receives from platoon headquarters part or all of the following information: Location of the enemy, of friendly scouts who are fighting, of troops to the right and left of the platoon, of company headquarters; plan of attack—what leading section is to do, where rear section is to go, by what route, what it is to do when it reaches the indicated position; special signals; location of platoon headquarters during the maneuver.

(6) When directed by the platoon leader, he returns to his section, assembles his squad leaders and scouts under cover and issues his orders. If he can do so without undue loss of time and without getting more than 30 or 40 yards from the section, he assembles the squad leaders and scouts where they can see the target and the general route to be taken.

(7) The section leader's order to the assembled group follows the form given in TR 420–105. He states, so far as he can with the information he has received (and, if possible, points out), the enemy position and platoon target; location of friendly scouts who are firing, of platoon headquarters, of company headquarters, of troops on right and left; states plan of attack—what leading section is to do, where rear section is to go, by what route, and what it is to do when it gets there; special signals. He tells the scouts what they are to do and, if they are used as a patrol, designates a patrol leader; gives the formation the section is to take; states where he will be; assures himself that all leaders and scouts understand; answers any questions.

(8) In such a movement the section is protected by scouts. They will usually give best protection by being formed into a patrol under a designated leader. Men are detailed to watch to the flanks. One man follows the section as getaway man.

(9) The formation for the rest of the section will depend largely on the ground. Such cover as narrow, winding gullies or places that the enemy can not easily guard with small-arms fire should be used whenever possible. When working along ditches and using similar cover, the section will be in squad columns or columns of twos. In woods, line of squad columns is usually the best formation.

(10) Formations for all conditions can not even be suggested. If he bears in mind what he has been ordered to do, the principles given in paragraph 3 will enable the leader to choose satisfactory formations.

(11) When conducting his section on any independent move, the section leader marches between the scouts and the section in a position where he can control his section and quickly make a reconnaissance.

(12) If the section is fired upon, the leader attempts to work the entire section past the resistance and to carry out his mission. (See TR 420–105.)

(13) If he finds this can not be done quickly, he detaches a squad and has it attack the resistance holding up the section. Under cover of this fire he attempts to work the remainder of the section to a position from which it can attack the platoon target. If necessary, he detaches two squads for this purpose and works the remaining squad forward. If only an automatic rifleman and an assistant reach a position close to the target, they will be able by fire to assist the other section of the platoon to reach a point from which it can assault and destroy the resistance.

(14) As soon as he finds the section is to be delayed and that it will take longer than expected to carry out his mission, the leader sends a runner to platoon headquarters with complete information.

(15) When the section, or when a part of the section (if part has been detached), approaches the platoon target, the section leader, under cover, makes a personal reconnaissance and an estimate of the situation. He then assembles his scouts and group leaders and issues his orders.

(16) Section leaders must provide security during the attack when the section is acting alone. One man on each flank or on the flank exposed to the enemy, to watch for the enemy from these points, will usually be sufficient. If enough cover is available, the section leader may assemble the entire section. Even then men must be detailed to watch to the flanks and to the rear.

Situation.—The platoon at A (pl. 53) was held up by machine-gun fire from the vicinity of C. You are leader of the rear section. The platoon leader called you to him at A, pointed out the target—machine guns at C—directed you to take your section along the general route D–E and attack the flank of the resistance. You received no further information.

Requirement.—Assuming no resistance met on the way, what orders do you issue, and what do you do up to the time you reach your first firing position?

(17) Whether all of the section or only a part is able to get close enough for an attack on the platoon target, every effort is made to get to the position without being seen and to open fire at the same instant with the entire available fire power. A sudden heavy burst of fire, delivered without warning from a flank, will demoralize the defender and afford cover for an advance.

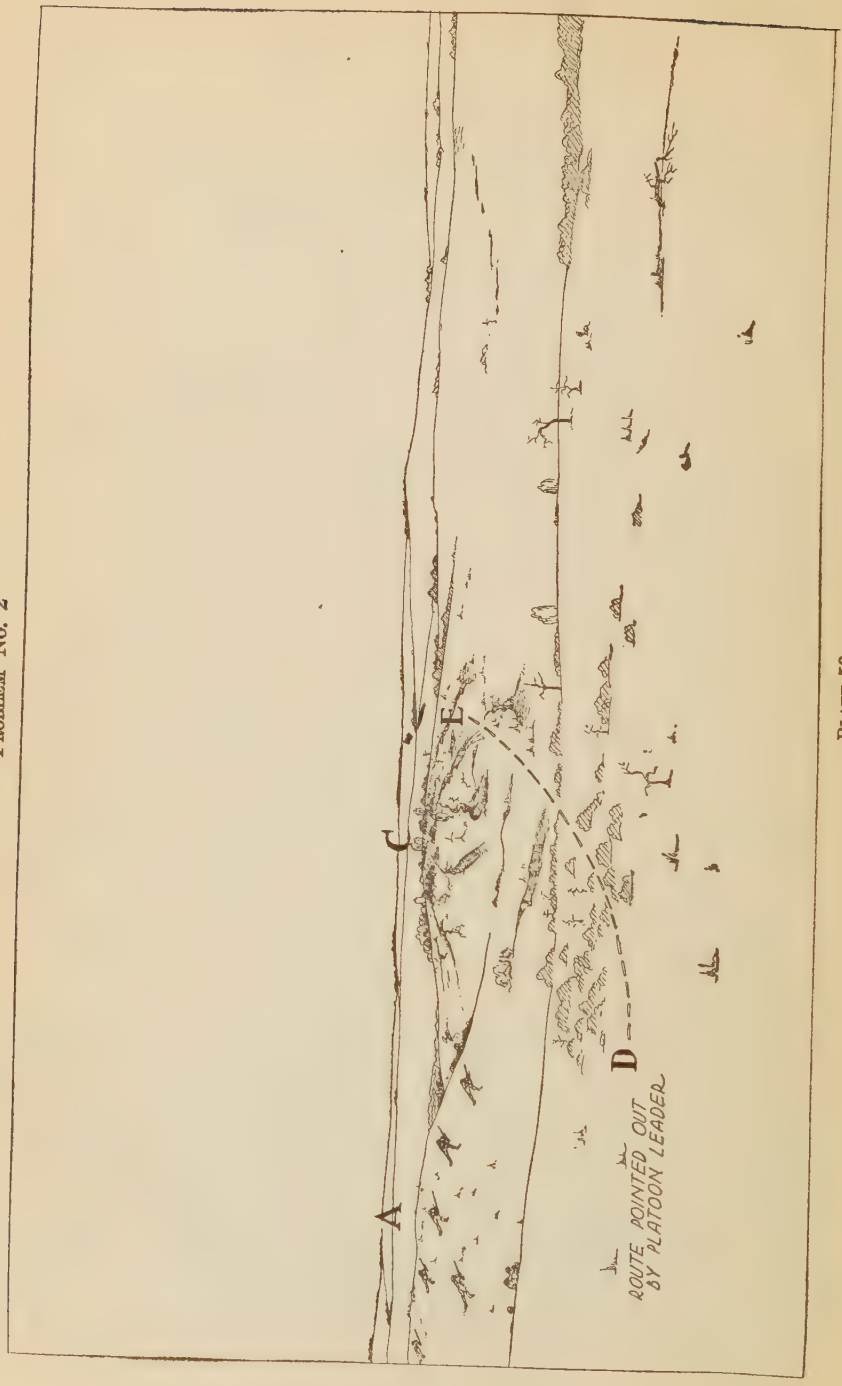
(18) In a combined frontal and flank attack, either section may remain in position and fire while the other delivers the assault. This will usually be arranged by the platoon leader. If not prescribed, each section pushes forward whenever the fire of the enemy permits.

(19) The course of action outlined above takes time. Successful attacks, except in emergencies, must be carefully planned, and each man of the section must know the part he is to play.

6. The assault.—*a. Description.*—The assault is the final phase of the attack whereby the enemy is dislodged from his position with the bayonet or the threat of the bayonet.

b. When delivered.—The assault is delivered at the earliest possible moment that promises success. This usually occurs when the hostile fire has become materially less effective. It frequently happens that men on the firing line recognize this situation as quickly as the leaders, and, without waiting for orders, in the excitement of the action, rise singly or in small groups and push forward. Although it is the duty of the officer or petty officer in charge of the firing elements of the platoon to decide when and how the assault is to be delivered, if started in this manner at a time that promises success, the entire line should at once be brought up and the assault launched.

c. Following a rolling barrage.—(1) If the assault element is preceded by a rolling barrage, general alignment is maintained. In order that they may arrive at the hostile position the instant that the barrage lifts from it, the leading troops are kept as close as possible to the barrage. Any delay at this moment is fatal, since it gives the enemy an opportunity to man his position and open fire on the assaulting troops at point-blank range. A single



PROBLEM No. 2

PLATE 53

machine gun opening fire from the hostile position after the barrage has lifted and before the assaulting troops reach there will cause more casualties than the short bursts of a few shells of the friendly barrage.

(2) The barrage itself will not drive the enemy from his position. By keeping him down it facilitates the advance of the infantry to a point from which it can close with and neutralize the hostile garrison.

d. Without the protection of a rolling barrage.—Troops are controlled during the assault principally through the squad leaders. (See TR 420-105.) The section leader and section guide see that squad leaders keep a general alignment and steady their men.

e. Assault fire.—(See TR 420-105.) Assault fire in the open promises success only when danger of fire by the enemy from front and flanks is slight. If units on the right and left of the section are far enough forward to protect the flanks, and friendly artillery and machine-gun fire is covering ground behind the position to be assaulted, the section may be brought up and moved forward as explained for the squad in TR 420-105.

7. Reorganization.—(See TR 420-105.) *a.* As soon as a position has been taken, the platoon commander will provide for the protection of the platoon and dispose the sections in depth to meet a counterattack. Any other preparation to be made will be indicated by platoon headquarters.

b. Control.—The section leader's first duty is to regain control of his squads.

c. Replacing casualties and regrouping squads.—The section leader appoints a section guide and squad leaders if any of these have become casualties. He issues orders for regrouping squads. (See TR 420-105.)

d. Ammunition.—Ammunition is redistributed.

e. Prisoners.—Prisoners are disposed of in accordance with instructions from the platoon leader or higher authority.

f. Before continuing advance.—After the reorganization has been completed and before the advance is continued the section leader satisfies himself that his orders for reorganization have been carried out.

g. Section guide.—The section guide assists the section leader in the reorganization by personally supervising the squads and seeing that all orders are properly carried out.

Section III.—SECTION IN DEFENSE

	Paragraph
Description	8
Mobile situations	9
Stabilized situations	10

8. Description.—The defense of an area is made by placing small groups in positions from which they can cover ground to their front and flanks. The platoon area is held by the platoon as a single group or with each section as a group, the groups being separated from 50 to 150 yards.

9. Mobile situations.—*a. Distribution of men.*—Within the section, groups may be of from 4 to 8 men. The platoon leader usually indicates the location of the groups and their sectors. Otherwise, the section leader assigns each group a position from which it can cover *with fire* its own front and flanks and the front and flanks of the groups on its right and left. (See pl. 54.)

b. Preparation of the ground.—(1) When the platoon leader indicates the positions, he directs the sections to construct defenses. Section leaders supervise the work of their sections. If work is to be done by reliefs, the division of the platoon will be made by the platoon leader. Each relief is assigned a definite task on which it works until completed.

(2) Men work in pairs. One man works as hard as he can for 4 or 5 minutes, when he is relieved by the alternate man of the pair.

c. Positions for automatic weapons.—Automatic rifle positions must be constructed to cover the front of the area held by the section. These emplacements are most effective when on the flanks and sited at an angle to the enemy line. They then give the automatic oblique fire and can not be seen from the front. These positions should also be prepared to fire to the front, flanks, or rear of adjacent groups. If this is not practicable, other positions which will fulfill these conditions are prepared. In the absence of orders to the contrary, section leaders decide where these alternate positions are to be placed and order their construction.

d. The counterattack.—(1) Plans for the counterattack will be made and instructions for counterattacking given by the platoon leader.

(2) The section counterattacks as—

(*a*) Part of a support platoon.

(*b*) The rear echelon.

(3) When a support platoon counterattacks, the section leaders are under the direct control of the platoon leader.

(4) When a first-line platoon is deployed in two lines, the section in the rear line makes the counterattack. It may be assisted by elements from the support platoon, but must be prepared to fight alone.

(5) The time the enemy may deliver his attack can not be foreseen. The leader of the rear section must be ready to act at any moment. He organizes for counterattack as soon as the section takes position. Routes of approach

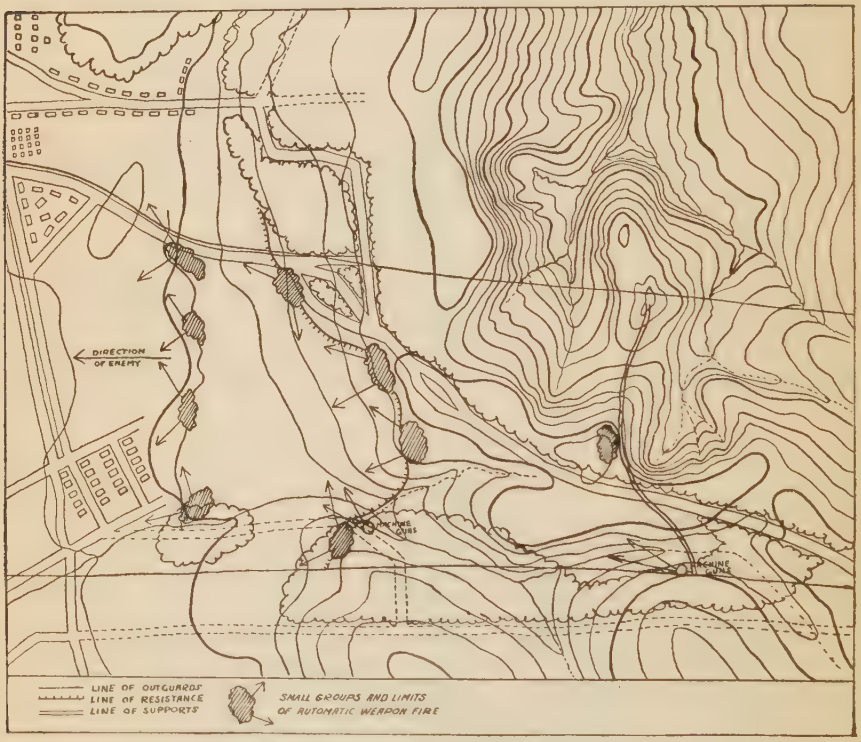


PLATE 54.—Disposition in defense of small groups

are selected and indicated to the groups which are to use them. There is no time after the attack has started to obtain information or make plans. The signal for starting the counterattack is usually given by the enemy himself. The only information that the section leader can expect is the general direction of the attack.

(6) The plan for counterattack is explained to all men of the section. Each man should know exactly where he is to go and what he is to do.

(7) As soon as the enemy enters the position, he must be attacked and driven out. When he has just entered the position he is disorganized and is fighting on new ground. This is the opportunity of the defense. If attacked *at once* he can be dislodged and driven back.

e. Following a successful counterattack.—After a successful counterattack, immediate preparation must be made to meet another attack. Having failed the first time, the enemy will promptly launch a second attack. If this is repulsed, he will follow with others.

10. Stabilized situations.—*a. Description.*—In combat, when ground has been occupied by opposing forces for some time, an elaborate system of trenches will usually be prepared. Service then becomes, for the time being, more or less routine. This phase of combat is known as a *stabilized situation.*

b. Section going into line.—Detailed instructions are issued by the platoon leader as to what equipment men will carry when the platoon is ordered to duty in the trenches. The section leader is responsible for the preparation of his unit in accordance with the instructions received.

c. On entering trenches.—(1) The section leader posts sentinels to relieve those of the outgoing platoon.

(2) He assigns men to dugouts, informs them of the location of trench supplies, and makes known to them any information he has received since entering the line.

(3) He shows squad leaders their sectors and tells each man what to do in case of attack.

(4) He requires squad leaders to show all men their posts.

(5) If the platoon leader does not give him the following information, the section leader asks for it at the first inspection by the platoon leader after daylight.

(*a*) Location of enemy position and any new information.
(*b*) Parts of trenches exposed to fire of enemy snipers.
(*c*) Location of alarm apparatus.
(*d*) Signals for starting and stopping barrages.
(*e*) Location of platoon, company, and battalion headquarters; location of battalion first-aid station; routes to these.
(*f*) Passages in own wire.
(*g*) Names of roads in or near the sector and where they lead to.
(*h*) Names of villages in sight.
(*i*) Where water can be obtained.

d. Routine duties of section leader.—The daily duties of the section leader include:

(1) Making inspections of arms and equipment, of sentinels on duty, of dugouts, of alarm apparatus, of construction work, and of latrines.

(2) Assuring himself that men in shelters are prepared to leave at once and go to their posts; that all know what to do in case of an attack; that squad leaders know their duties; that men carry out orders when practice alarms and gas alerts are held; that details furnished by the section are at the proper assembly point on time and correctly equipped.

(3) Reporting casualties and sickness to platoon headquarters.

e. Control of section by leader.—The leader controls his section through the section guide and squad leaders, giving orders to them and holding them responsible for carrying out his orders. The section guide must at all times be kept informed of all work and duty to be performed by the section.

f. Duties of section guide.—The section guide—

(1) Replaces the section leader when he becomes a casualty.

(2) Carries out the orders of the section leader and assists him in every possible way.

(3) Keeps the duty roster for the section.

(4) Takes charge of the section in the absence of the section leader.

g. Relief from duty in the line.—When the platoon is being relieved from duty in the line, section leaders are responsible that no men leave their posts until the first relief of the incoming unit has been posted and is thoroughly familiar with its duties.

Section IV.—NIGHT OPERATIONS

	Paragraph
Instructions to troops	11
Marches	12
The approach march	13
The attack	14
The pursuit	15

11. Instructions to troops.—*a.* Marches and attacks at night will be frequent in war. Troops moving near the enemy at night or in fog or rain, are very sensitive. Each man of the section must know thoroughly beforehand his part and the part the section and platoon are to play in the movement. In this way confusion is avoided and all ranks are enabled to enter into the spirit of the operation.

b. All commands and verbal orders will be given in a low voice. Whistle signals should not be used.

12. Marches.—*a. Preparation.*—Careful and thorough preparation for a night march must be made before the march commences. Equipment is prepared to prevent flashing or rattling. Prearranged signals are practiced.

b. March discipline.—During marches at night, march discipline is strictly observed. Men keep well closed up, particularly during halts. When resting for short periods, they must not be permitted to fall asleep.

c. Rate of march.—The rate of march for troops moving at night is slower than during the day.

13. The approach march.—*a. Formation.*—The formation will usually be section columns, one section in rear of the other without distance or at a few yards' distance. In this forma ion, scouts of the leading section, formed as a patrol, precede the platoon. Section leaders march at the heads of their sections. Men in ranks keep well closed up.

b. Bayonets.—Bayonets are fixed on order of the platoon leader, usually before the march starts.

14. The attack.—*a. Action of section leaders when the enemy challenges.*—(1) In an attack at night, enemy outguards or patrols may be met before the platoon reaches its final position. The instant a challenge is heard, the scouts answer and rush in with the bayonet.

(2) Both sections halt immediately and kneel or lie down. If the scouts are unable to take care of the enemy outguard or patrol, the platoon leader may rush part of the leading section to their assistance. At this time, section leaders and guides concern themselves particularly with keeping the sections in hand and ready for any emergency.

b. Firing at night.—Attacking troops do not fire. Rifle fire at night by attacking troops is always ineffective. It is just as dangerous to friendly troops as to the enemy. By revealing the extent of the attack, size of the force and its location, the effect of the surprise element—the chief advantage of a night attack—is greatly reduced. The bayonet only is used.

c. Consolidation.—(1) When the platoon reaches its position, the leader assigns each section an area for defense and issues detailed orders for holding the ground occupied.

(2) In the absence of orders, section leaders dispose their squads and prepare for defense in accordance with the principles laid down in Section II.

15. The pursuit.—Pursuit during darkness is seldom attempted after an attack at night. A successful night attack is best exploited by immediate preparation to resist a counterattack.

Section V.—SECURITY ON THE MARCH

	Paragraph
Descriptions	16
Advance guard	17
Flank protection	18
Rear guard	19

16. Descriptions.—*a. Security on the march.*—During route marches, groups are sent to the front, flanks, and rear of the column to prevent the main body from being attacked or fired into before it has had time to deploy and, by driving off enemy patrols to facilitate the march of the main body.

b. Advance, flank, and rear guards.—The front, flanks, and rear of columns pushing forward in an attack are similarly protected. The groups themselves are known, respectively, as *advance guards*, *flank guards*, and *rear guards*.

c. Dispositions.—Plate 55 shows the general dispositions of the protecting groups with respect to the main body.

17. Advance guard.—*a. Subdivisions.*—Advance, flank, and rear guards in turn send out groups for their own protection. Plate 8 shows the main subdivisions of an advance guard.

b. Advance party.—(1) The advance party is sent forward by the support. A section may be employed as advance party.

The mission of the advance party is to provide for the security of the support by driving off enemy patrols or checking an attack until the support has had time to deploy.

(2) The advance party, in turn, sends forward a point. (See TR 420-105.) The point for a section as advance party is usually four men.

(3) The commander of the advance party states in his orders the distance at which the advance party will follow the point or at which the point precedes

the advance party. In open country with a section as advance party this will usually be not less than 100 nor more than 400 yards. In close country it may be only 50 yards.

(4) The distance between the advance party and the support will be determined by the support commander. The support usually follows the advance

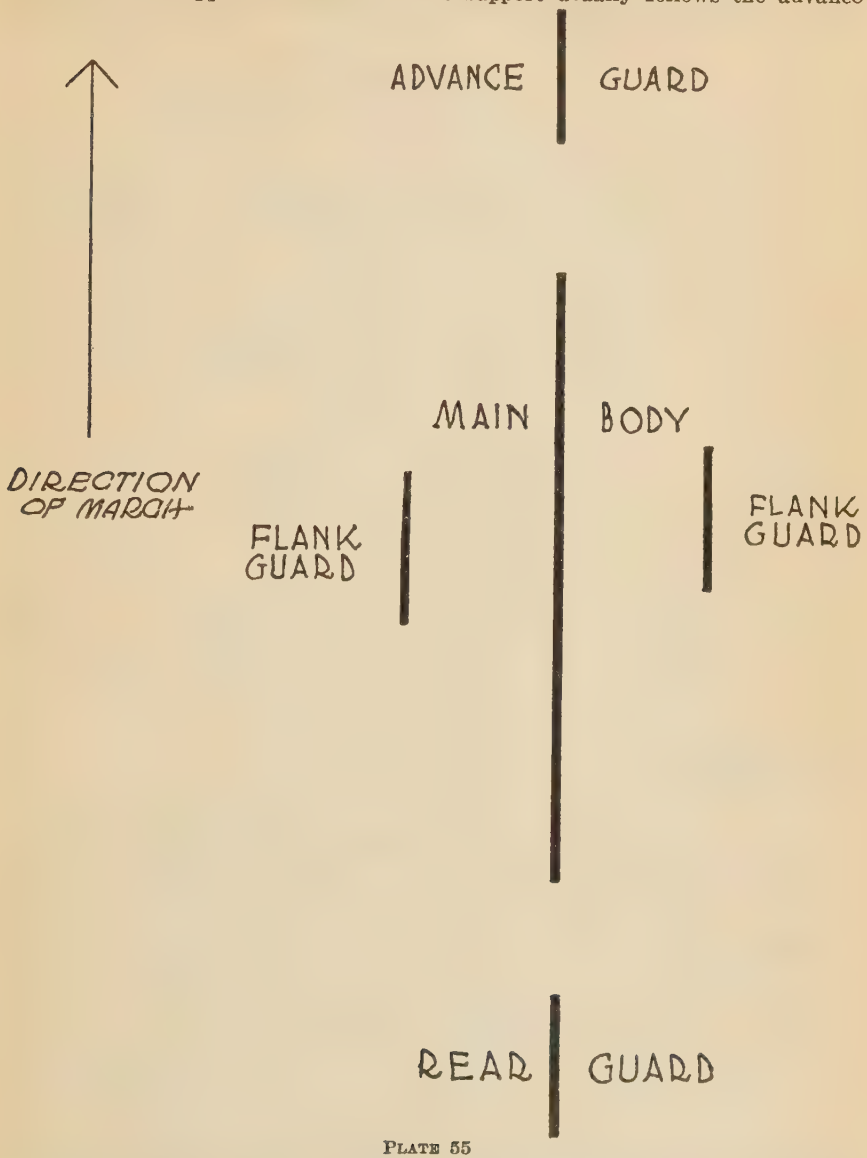


PLATE 55

party at the distance stated. In this case the advance party commander is responsible for the rate of march. The support sends forward connecting files. (See TR 420–105.)

(5) The formation of the advance party is column of twos, one file on each side of the road.

(6) The advance party commander usually marches at the head of the advance party or between the point and the advance party. He goes, however-

where he can best observe the ground, make an estimate of the situation, if resistance is met, and direct action to be taken.

(7) He is responsible for the route of march when route marching, and for the assigned direction in an approach march.

c. Patrolling.—(1) If the support commander does not state in his orders what patrolling is to be done by the advance party, this information must be asked for.

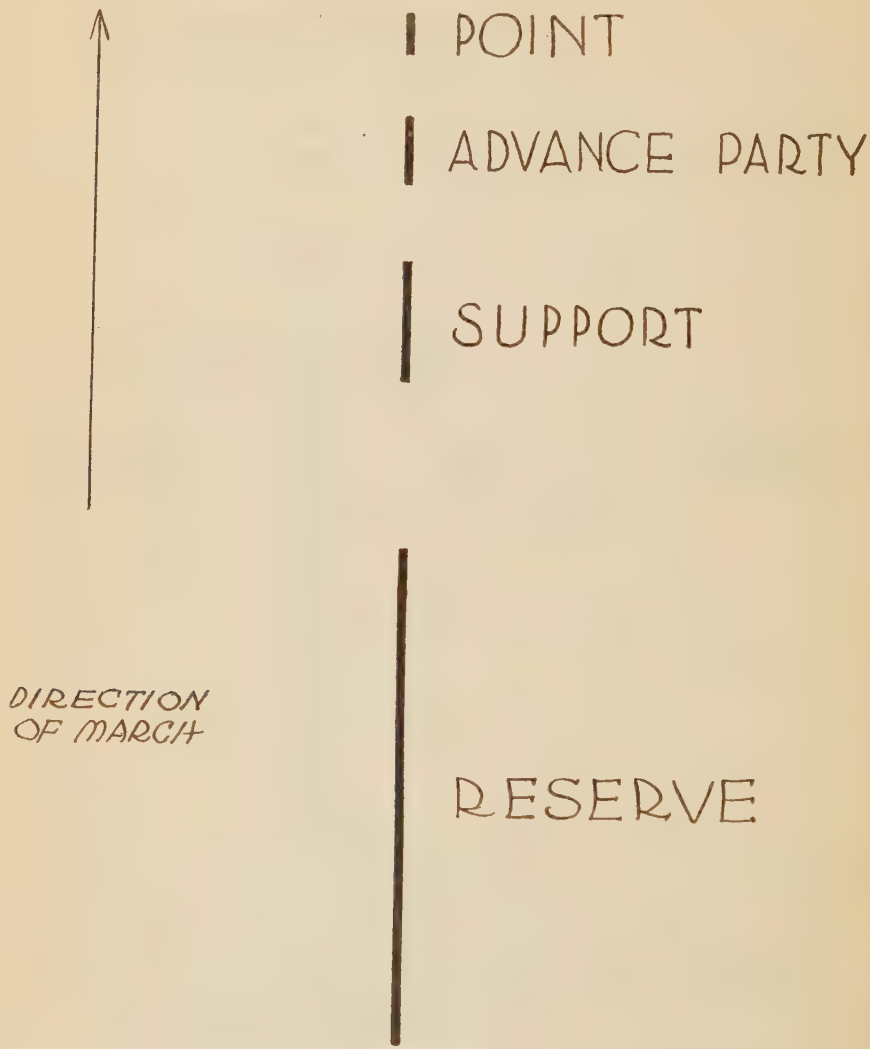


PLATE 56

(2) Patrols sent from the advance party to distances greater than 200 or 300 yards will rarely be able to keep abreast of it or to rejoin it until night. A patrol sent farther must be considered lost for the day.

(3) Patrols are sent to high points which might be held by the enemy or which give a good view of the country. They are used to protect the column from ambush when it is passing through woods.

(4) A patrol sent out by an advance party of one section is not ordinarily composed of more than three men. The formation and action of these patrols are similar to the formation and action indicated in TR 420-105, for the squad.

(5) Cavalry to the front can not take over the duties of the advance party, which must patrol as though there were no protection ahead.

d. Action of advance party when resistance is met.—Any resistance which the point is unable to overcome is taken care of by the advance party. The advance party attacks at once without hesitation or special reconnaissance unless orders are received to the contrary. Every effort is made to clear the way quickly for the remainder of the column. When the resistance has been overcome, the march is quickly resumed.

18. Flank protection.—*a.* Troops on the march provide for flank protection by numerous means, among which are flank guards.

b. The network of existing roads is seldom such that units as small as a section will find a parallel road within supporting distance of its main body upon which to march. Under such conditions, flank protection is obtained by sending troops to occupy positions on the flank until the main body has passed. These men then join the tail of the column and continue the march.

c. Similarly, flank guards must provide for their own flank protection.

d. A section acting as a flank guard, in case a parallel road is available, usually marches in columns of twos, one file on each side of the road. It sends forward three or four men from 100 to 300 yards. Two men follow in rear as rear point. Protection on its exposed flank is obtained by sending small patrols to high points along the route. The size of such patrols is seldom more than three men. They must be sent to such points as necessary along the flank

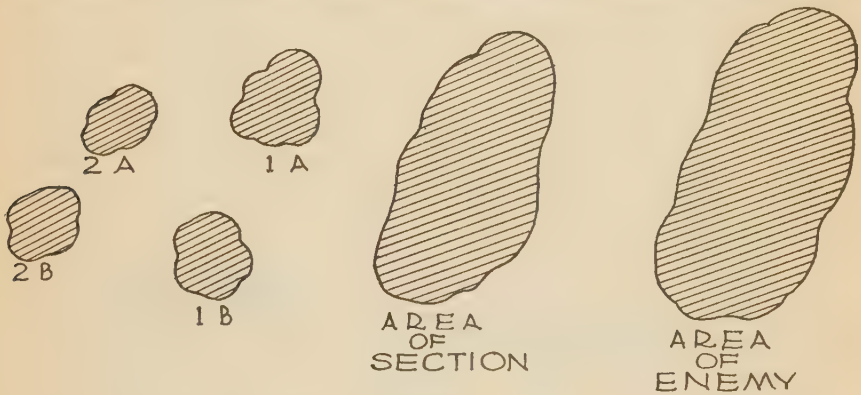


PLATE 57

to secure protection and guard against surprise. They should not be sent so far that they will be unable to join the section except by forced march.

e. The position of the section as a flank guard on a parallel road must be such, with respect to the body which sent it out, as will prevent the enemy from avoiding the flank guard and attacking the main body.

f. The flank party commander usually marches at the head of his column, but is free to move to any position where he can observe what is going on and direct necessary action to meet the situation.

g. If the commander sending out the flank guard does not state which unit is responsible for keeping contact, this information is asked for. In the absence of orders the flank guard commander keeps contact. Contact between the flank guard and main column is kept by two-men patrols. At intervals on the march these patrols go to high points from which the main column can be seen. They serve to reconnoiter the ground they visit and to keep the flank guard commander informed of the location of the main column.

h. Small groups of the enemy are attacked at once. When the resistance can not be dealt with by the section alone, the commander thereof informs the commander of the body which sent him out. The flank guard holds the enemy off until it is thought that the main column is safely by and then disengages itself from the fight and rejoins the main column.

i. An attack in force is resisted to the last man.

j. If the section is delayed in action by a force approximately its own strength and the body which sent it out is known to have passed on, the commander of the section disengages part of his force alternately and each part in turn, under cover of the fire of the other part, withdraws. (See pl. 57.)

k. Plate 57 illustrates alternate positions of withdrawal. 1A is the position taken by the part first disengaged; 1B the position taken by the part last engaged. 2A and 2B similarly indicate the second positions taken.

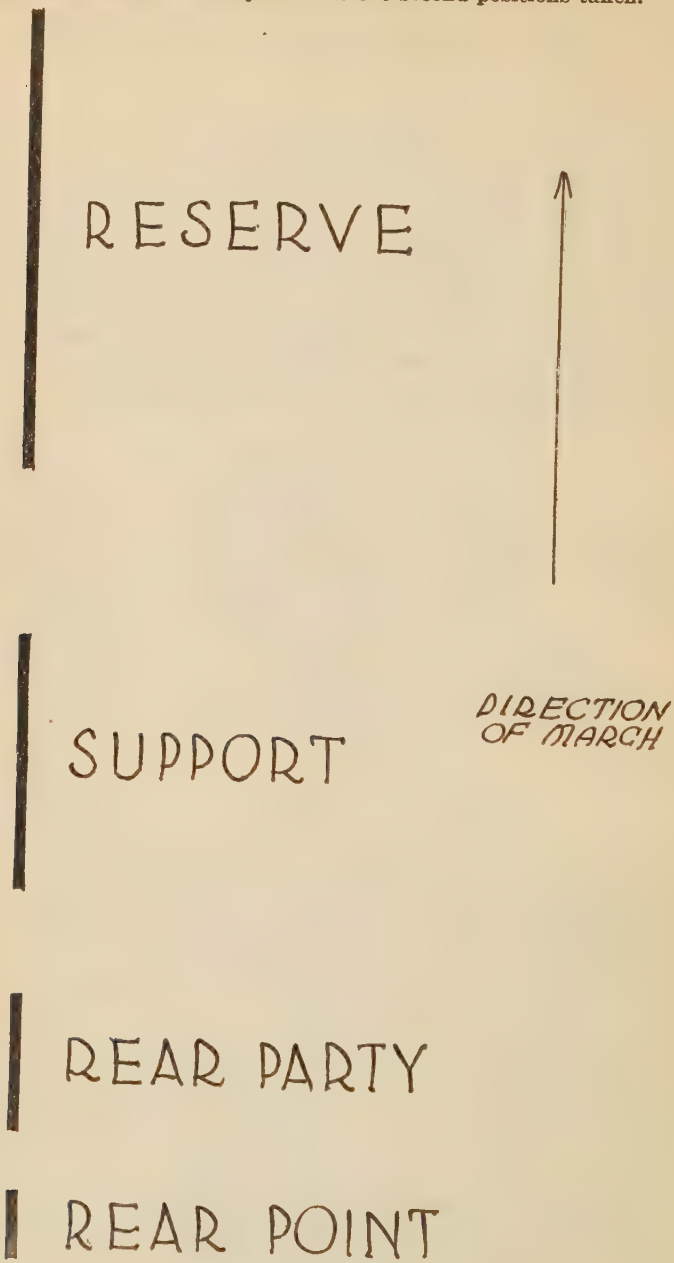


PLATE 58

l. Moving in this manner by bounds to the rear, the section withdraws until free of the enemy. It then reforms and joins, without unnecessary delay, the unit which sent it out.

19. Rear guard.—*a. Subdivision.*—Plate 58 shows the main subdivisions of a rear guard.

b. Rear party.—(1) A rear party is sent back by the rear guard support to protect it from surprise and by checking the enemy's advance and beating off his patrols to facilitate its march. A section may be employed as a rear party.

(2) A section as rear party will usually be directed to follow the support at from 100 to 500 yards. It marches in column of twos, one file on each side of the road.

(3) It sends back a rear point of 4 to 8 men. (See TR 420–105.) The rear party commander determines, and tells the leader of the point, the distance at which it is to follow the rear party. This distance will rarely be greater than 400 yards. In close country, the distance is less than in open country.

(4) The rear party drops back necessary connecting files. (See TR 420–105.)

(5) The rear party commander usually marches behind the rear party. From this position he can quickly decide what to do if the point is fired on.

(6) Patrolling to its flanks by a rear party of this size will be rare and will be confined generally to distances not exceeding 200 yards. The patrols must be able to rejoin the rear party. Rear guard patrols will usually be sent from the support and will join the rear party.

(7) When the rear point is fired on, the rear party commander makes an estimate of the situation (see TR 420–105), and decides upon a plan of action.

(8) The rear point is reinforced when it occupies the only available firing position and a stand must be made. This will be most unusual.

c. Action of rear party when attacked.—(1) If the rear party commander decides that it is necessary to fight, he ordinarily selects a firing position well to the rear of that taken by the point. He sends a runner to the leader of the point to tell him where the position is and to lead the point back in its withdrawal. (See TR 420–105.)

(2) The position taken by the rear party should give a good field of fire up to 800 or 1,000 yards and afford cover for the rear party to use in disengaging itself.

(3) As soon as the enemy appears, he is fired on. When he is within 400 or 500 yards, the rear party commander leaves a group of an automatic rifleman and two or three riflemen in position. Under cover of their fire the remainder of the section is withdrawn. This group may later follow as rear point.

(4) These steps may be taken in the situation usually met. Conditions will sometimes call for another procedure. Any plan is good which secures the support and with few losses to the rear party causes the enemy delay.

(5) The rear party can expect no assistance from the support. The support commander must be kept informed by signal or runner of the situation. If the support takes up a position, the rear party in withdrawing moves to a flank of the support in a manner similar to that shown for the squad in TR 420–105.

Section VI.—SECURITY AT REST

	Paragraph
Description	20
Subdivisions of an outpost	21
Section as a picket	22
March outpost	23
Section as a detached post	24

20. Description.—When troops in the field are halted for any considerable length of time, a system of protection, called *the outpost*, is established. Plate 59 shows the general scheme of protection by an outpost.

An outpost affords the main body time to meet an attack, prevents small bodies of the enemy from firing upon or observing the main body, and insures the uninterrupted rest of the main body except in case of an attack.

21. Subdivisions of an outpost.—In large commands the outpost from the main body toward the enemy is subdivided into a *reserve, supports*, and *outguards*. In small commands, there will usually be no reserve.

The number of supports and the number of outguards will depend upon the size of the command, local conditions of terrain, and the enemy.

22. Section as a picket.—*a. Description.*—An outguard larger than a sentry squad is called a *picket*. (See TR 420–105.) A section may be called upon for picket duty.

b. Mission of the picket.—Pickets are usually sent to road junctions or placed on prominent routes along which the support commander thinks the enemy may come. They are ordered to prepare their positions for defense and

to hold on or withdraw when attacked. If ordered to withdraw, a picket prepares for temporary defense only.

c. Means picket uses for self-protection.—(1) A picket protects itself by means of single sentinels, cossack posts, sentry squads, and patrols. The number of these protecting groups depends on the strength of the picket, on the ground and the extent of the sector for which it is responsible.

(2) In general, when the outguard is to cover a narrow open sector a cossack post will be large enough. If the sector is wide and the ground too varied for one man to observe closely, a sentry squad should be used.

(3) A picket of two squads furnishes no more than one or two cossack posts. If the terrain is open, the sector narrow, and observation from one near-by point sufficient to cover the entire sector, a single sentinel may be sufficient.

(4) A picket of three squads might furnish a cossack post or a sentry squad and one patrol. The number of men at the post of the picket must be at least equal to the number furnished for its own protection.

(5) The picket is numbered as an outguard.

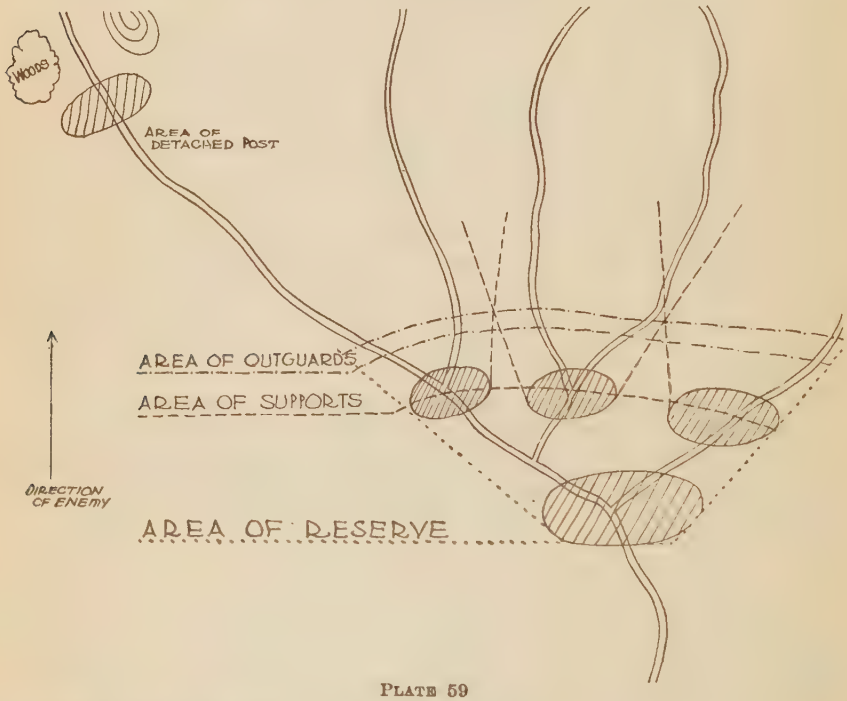


PLATE 59

(6) Cossack posts and sentry squads sent out from a picket are numbered from right to left and are called sentinel posts.

(7) In Plate 60 the Cossack post is called sentinel post No. 1; the sentry squad, sentinel post No. 2.

(8) Sentinel posts of a picket as small as a section will not usually be sent farther than 300 yards from the post of the picket. They are placed to give the picket ample warning of the enemy's approach. They are instructed to fire on the enemy as soon as he offers a target and to fall back in time to prevent capture.

d. Information picket commander should receive.—The picket commander is given by the support commander the direction of the enemy and any information he may have about his strength, expected actions, etc.; location of the reserve, of adjacent supports, and of the support sending out the picket; sector of the support; location of the other outguards the support is furnishing; location of examining posts; patrols sent by the reserve through the support sector; names of roads, villages, and similar features in support sector; where the main defense is to be made; strength of the picket, its location, special patrol-

ling it is to do, special preparations for defense by the picket, action in case enemy attacks, if it is to withdraw the route it will take and position it will occupy after withdrawal, messing arrangements; where messages will reach the support commander.

e. Action of picket commander when he receives his orders.—(1) The picket commander returns to his unit; points out to all men the direction of the enemy; shows them where the support is to be and what its sector is; tells them where the examining post is to be; gives information of any patrols sent by the reserve through the support sector; tells them where the main defense is to be made and if the picket is to withdraw when the enemy attacks; indicates

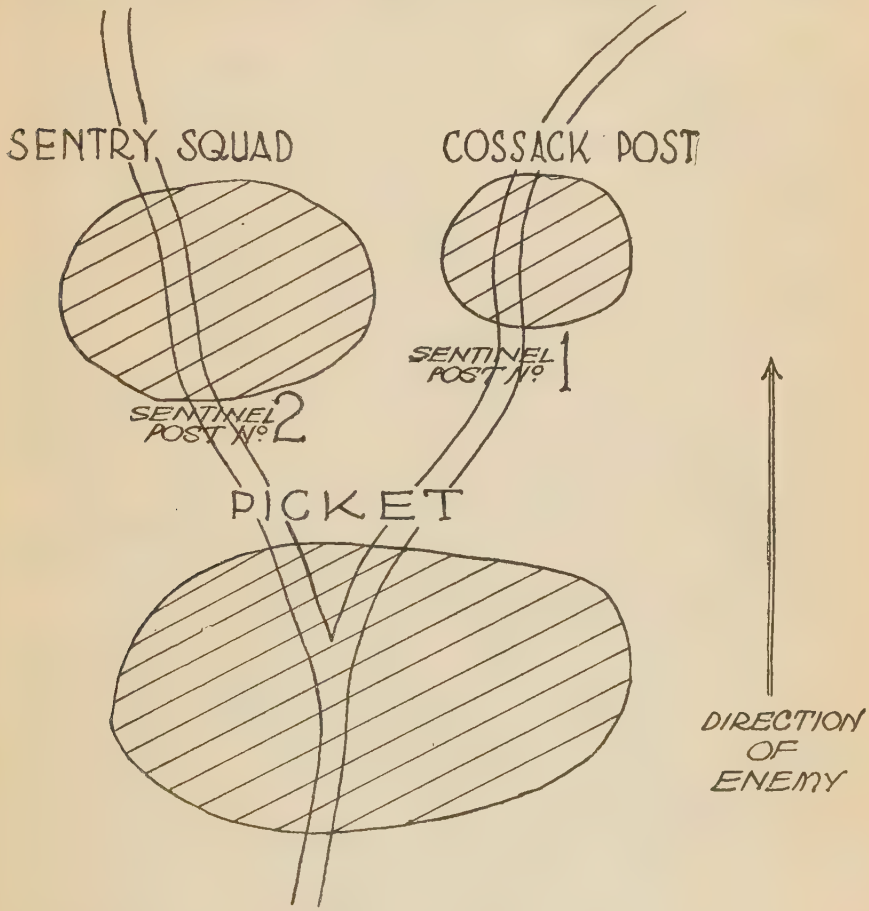


PLATE 60

where it will go and what it will do; gives the arrangements for messing; states where headquarters of the support will be.

(2) He then sends out a point of 3 or 4 men (see TR 420–105), and under cover of this protection marches the picket to its post.

(3) As soon as the picket reaches its post, the commander makes a quick estimate of the situation (see TR 420–105), assembles the picket (less the point), and issues the remainder of his order.

(4) He details the groups which are to furnish protection for the picket; designates a leader for each; tells them names of roads, villages, and similar features in sector; where they are to go; what to do if the enemy approaches; shows them the route they are to take if they fall back and where they are to go; orders any special patrolling he may wish made; details sentinels for duty at the post of the picket, and states where he will be.

(5) If flares are to be used or other special signaling has been arranged for, this information is also given in the order.

(6) The form above is merely a guide. Every contingency can not be foreseen. Using the form as a guide, the picket commander, in his own words, gives all information needed to enable the picket to play its part under the circumstances.

(7) The situation may require that the picket be marched to its post and the entire order issued there. All of the information should be given all men at some time. The best teamwork is possible only when the entire picket understands the situation and what is expected of it.

(8) Members of a picket are at all times under arms ready for action. They may be allowed to fall out but must remain in the immediate vicinity. Smoking is never permitted.

f. Patrolling.—Connection between outguards of the same support and with adjacent supports is maintained by means of patrols sent from the support. These patrols are called visiting patrols. Patrols are sent along roads and paths in the area of the picket.

23. March outpost.—*a.* During short halts the advance, flank, and rear guards place troops in defensive positions to protect the column. These troops form what is known as a *march outpost.*

b. On 10 or 15 minute halts this protection consists in sending a few observation groups to near-by high points. At the noon halt, and when halting for the night, the outposting of the command will be more complete.

c. On the night halt the march outpost is relieved by the outpost for the night.

24. Section as a detached post.—*a. Description.*—Distant points not included in the general outpost line are sometimes occupied by groups sent from the main body or the outpost. These groups form what are known as *detached posts.* A section may be a detached post.

b. Mission.—A detached post may be sent to protect a feature of importance to the command, such as a bridge, or it may be detailed to cover, by means of patrols, a certain area.

c. Where sent.—A detached post is usually sent to a flank of the outpost line. Though nearly always furnished by the main body or the reserve of the outpost, a detached post may be furnished by the support.

d. Distance from main outpost line.—Detached posts will usually be a mile or more from troops of the outpost line. They are, therefore, subject to attack from any direction and must at all times be ready to resist to front, flanks, or rear. This all-around preparedness is best obtained by placing a few men to observe and holding the remainder under cover in readiness to resist.

e. Patrolling.—The patrolling to be done will depend upon the orders given the commander. Roads and paths to the post of the group are patrolled frequently. Patrols for such purposes are sent out at irregular intervals. If the mission is one requiring a stand to be made, the post protects itself by means of outguards and patrols and makes thorough preparation for all-around defense. If the mission is to reconnoiter a certain area and fall back when attacked, less preparation for defense may be made.

f. Connection with other troops.—Patrols from the main body or the outpost will connect the group with other troops.

g. How conducted.—A section as detached post is conducted, in general, along the lines indicated for a section as picket. (See par. 22.)

Section VII.—FLANK COMBAT GROUP

Paragraph
Flank combat group 25

25. Flank combat group.—*a.* The section acting as a flank combat group conforms, in general, to the principles governing the employment of a squad as a flank combat group. (See TR 420–105.)

b. The leader will be told to go to a certain place, or simply to move out as a flank combat patrol.

c. On the march, the leader sends a point of four men 50 to 200 yards to his front. He protects his flanks, if necessary, by small patrols of two men. A get-away man follows in rear.

d. When the section halts, observers are placed to watch the front, flanks, and rear. They should be in pairs. The remainder of the section is held under cover ready to resist in any direction. The section leader or guide studies the ground constantly. One man watches for signals toward the group being protected.

TRAINING REGULATIONS, NO. 420-115

INFANTRY

Combat Principles—The Rifle Platoon

		Paragraphs
SECTION I.	Assault platoon in attack	1–10
II.	Platoon in defense	11–13
III.	Support platoon	14–18
IV.	Night operations	19–25
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Section I.—ASSAULT PLATOON IN ATTACK

	Paragraph
Organization	1
Description of terms	2
Advance in route column	3
Approach march	4
The attack	5
The assault	6
Reorganization	7
The pursuit	8
Organization of ground	9
Resisting counterattack	10

1. Organization.—A platoon in combat comprises a platoon headquarters and two sections.

a. Platoon headquarters consists of—

1 ensign, in command.
1 platoon chief petty officer, second in command.
4 seamen, runners, one of whom is attached to the company commander in deployment for attack.

b. Each section consists of—

1 first petty officer, section leader, and platoon guide.
1 petty officer, section guide.
3 squads.

2. Description of terms.—A company in combat is usually divided into two groups, one forward and one in rear.

The forward group is called the assault echelon, the rear group the support echelon.

3. Advance in route column.—*a. Formation.*—The formation for route column is given by the company commander in his march order.

The platoon leader marches in the column at the head or in rear of the platoon. Runners form an extra rank at the head of the platoon, in rear of the leader and guide. Other file closers form extra ranks at the rear of the platoon. The platoon chief petty officer and rear guide march behind the extra ranks.

b. March discipline.—The platoon leader and all petty officers with the platoon strictly enforce march discipline. Straggling must be severely checked. Men are kept closed up at all times.

4. Approach march.—*a. Formations.*—Advance in route column is changed into the approach march by the company commander as soon as the fire or nearness of the enemy renders advisable a less vulnerable formation. The initial formation will usually be prescribed for the company at the time of deployment. Otherwise the platoon leader suits his formation to conditions. (See pl. 61.)

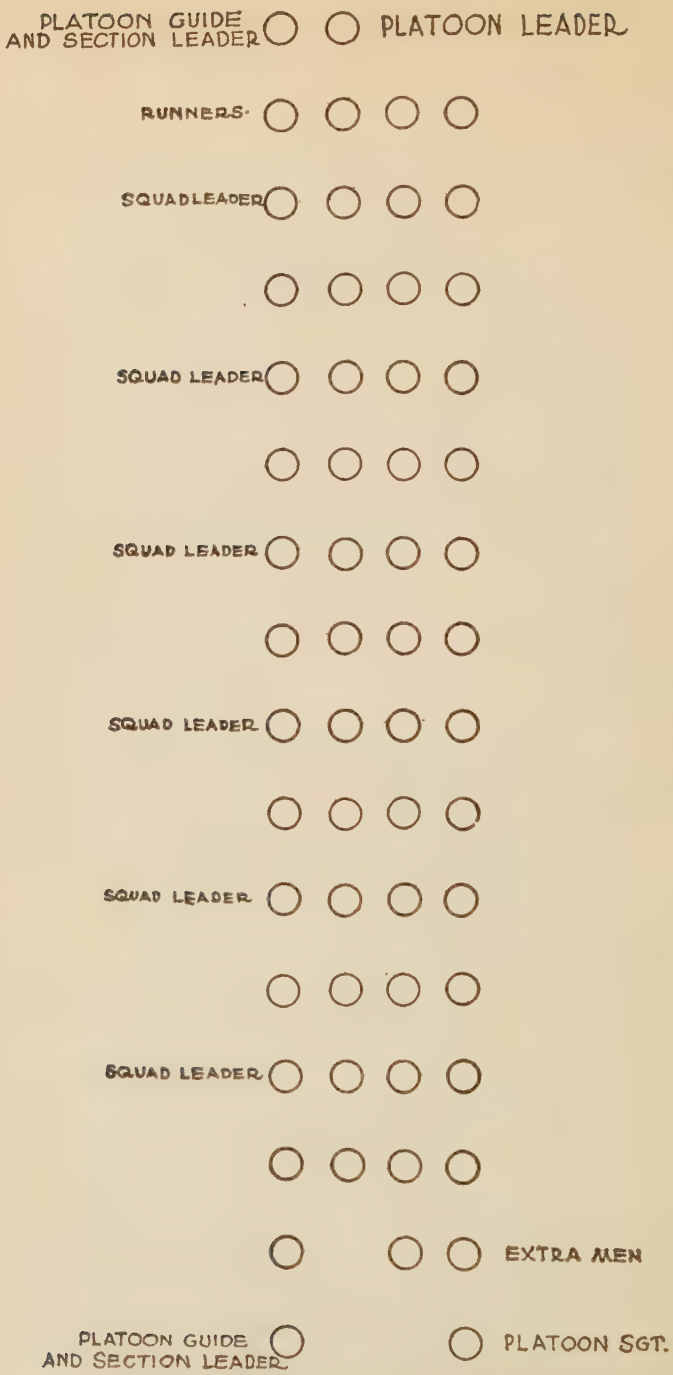


PLATE 61.—Platoon in column of squads

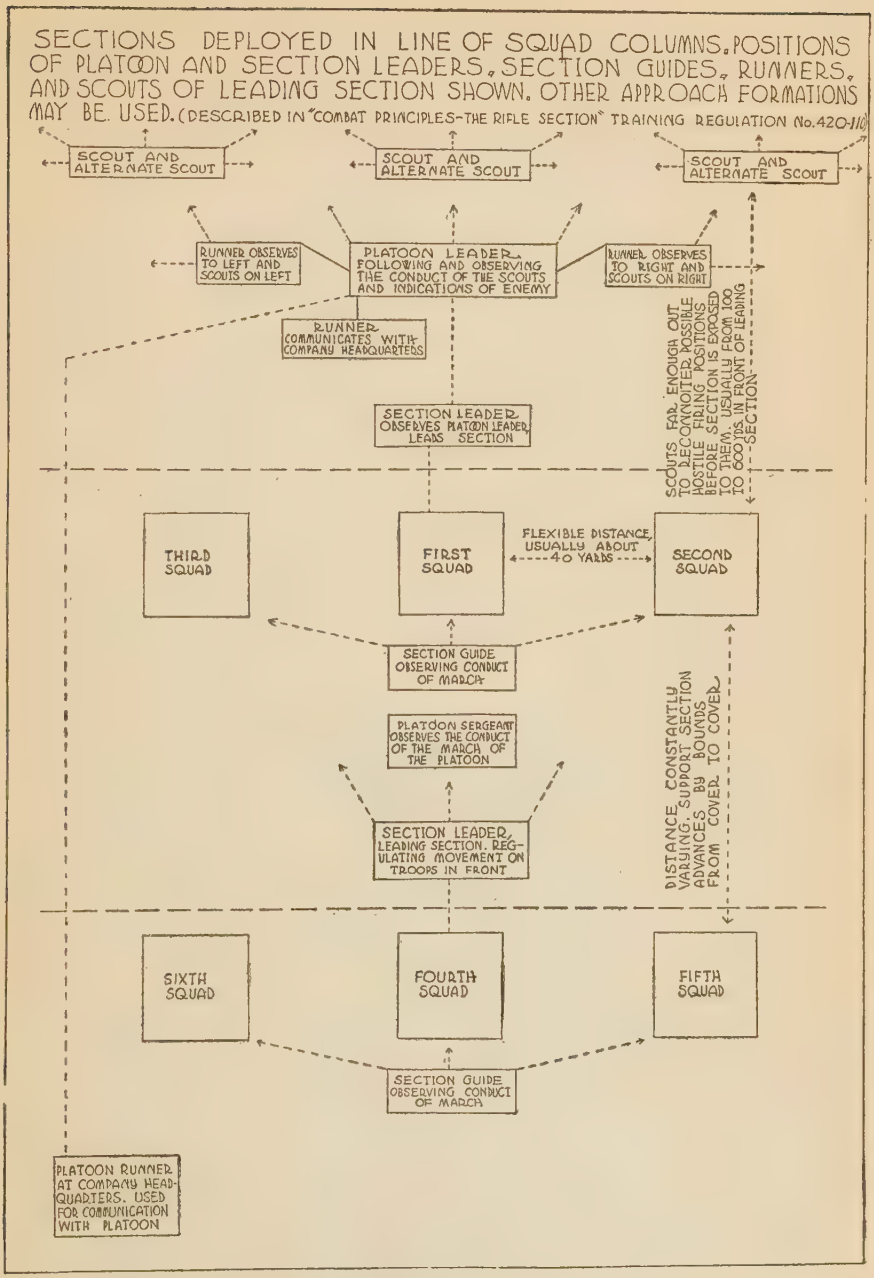
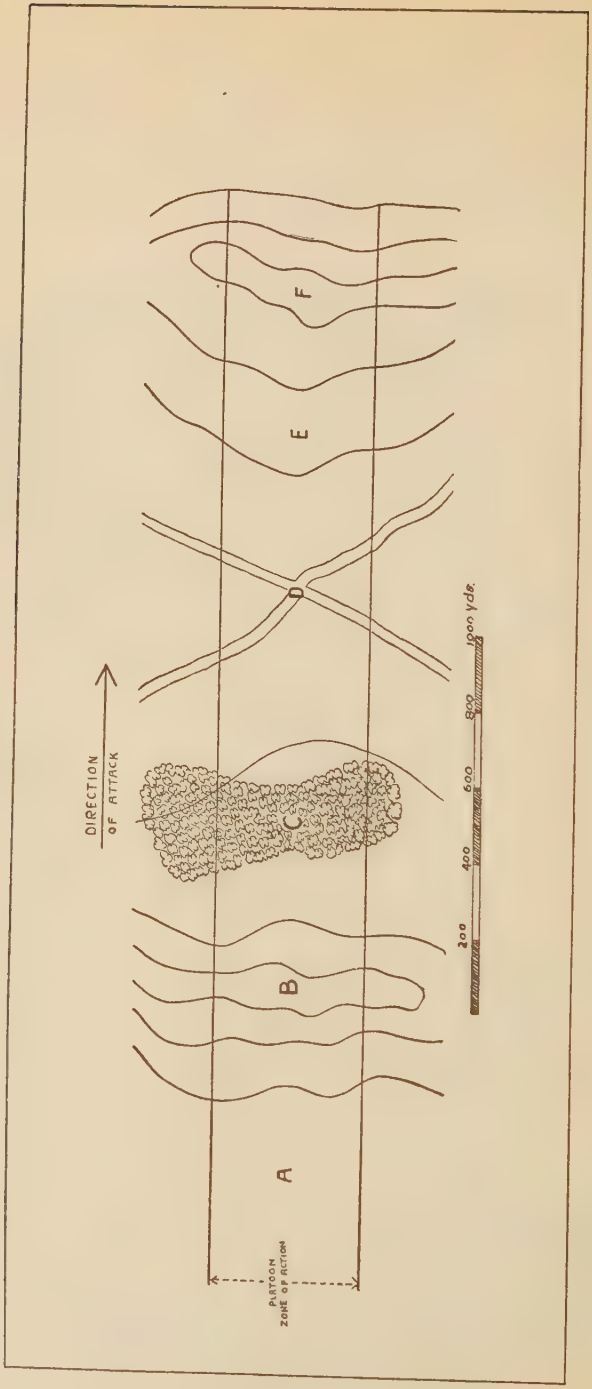


Plate 62.—Platoon in approach march



PROBLEM No. 1

PLATE 63

During the approach march section leaders change the formation of their sections to meet local conditions. (See TR 420–110.) The platoon leader is, however, responsible to the company commander for the formation of his unit. He looks back from time to time and orders any changes he sees fit.

Situation No. 1: Your platoon is an assault platoon in the approach march. It has reached A. The enemy is known to be in position ahead. Occasional shelling is the only indication you have had of his presence. You are the platoon leader.

Requirement: In moving to B (a ridge), what formation should your sections adopt? Why? In moving from B to C (a woods), what formation should they adopt? Why? (Pl. 63.)

Situation No. 2: As you leave C, heavy shelling of a section of the road at D (road) commences.

Requirement: What are your orders for getting the platoon by this obstacle?

Situation No. 3: When you reach E, heavy artillery fire is opened on the crest ahead at F.

Requirement: What method do you use to cross the ridge? Why?

b. Direction of march and zone of action.—(1) The direction of march is given the platoon leader in orders. He either receives a compass bearing or is shown on a map the limits of his zone of action.

(2) If, as will frequently happen, he has access to the map for only a few minutes, he makes a rough sketch showing prominent military features in and near his zone of action. (See pl. 64–A and B.)

(NOTE.—Numbers by marks on the right of pl. 64–B indicate distances from mark to mark.)

c. Base platoon and rate of advance.—(1) The company commander designates the base platoon of the company and the unit on which it is to guide. When a platoon is designated as the base platoon, its leader is responsible for the rate of advance.

(2) In general, a uniform rate of advance must be maintained. The platoon halts only by orders from the company commander, or when the unit on which it is guiding halts.

(3) Except to go around impassable obstacles or areas, the platoon does not leave its zone of action.

(4) In order to keep the general alignment, it is frequently necessary to increase the rate of march.

d. Use of cover.—Within the limits of its zone of action, the platoon takes advantage of such cover as ravines and draws to escape observation. Shelled areas, patches of woods which are gassed, prominent points on which enemy artillery may have registered, and crests are usually to be avoided.

e. Communication.—(1) Communication between platoon leader and his scouts is kept by means of runners. One runner joins company headquarters when the company takes up the approach march.

(2) Company headquarters in the approach will be well to the front, usually in sight of the assault platoon. Under these circumstances it is seldom necessary to send back messages. (See TR 420–105.)

f. Security.—(1) Security to the front is afforded by scouts of the leading section.

(2) In the approach, platoons on the general line will usually be close enough to afford mutual flank protection. Should units on a flank move so as to expose the platoon, a protecting group may be sent out by the company commander. In the event such disposition is not made, the platoon leader either designates a man or men to watch that flank or sends out a small flank patrol. If necessary, small patrols may be sent to both flanks.

g. Reconnaissance.—(1) Reconnaissance is the search for information concerning the enemy or the terrain. The reconnaissance is made by a personal visit, by personal observation from a distance, or from the reports of others who have obtained the information.

(2) In combat the platoon leader must make a personal reconnaissance whenever possible before he estimates the situation. (See TR 420–105.)

(3) During the approach his position is between the scouts and the leading section. He reconnoiters continually to the front and flanks.

(4) When danger of serious losses arises he should be with his platoon.

(5) The flank pairs of scouts reconnoiter to their respective flanks.

(6) One runner watches each flank.

(7) Reconnaissance during an approach must be rapid. The platoon can not halt for long periods of time while every dangerous place is being investigated. The prompt advance of all platoons on a general line will usually insure protection against surprise.

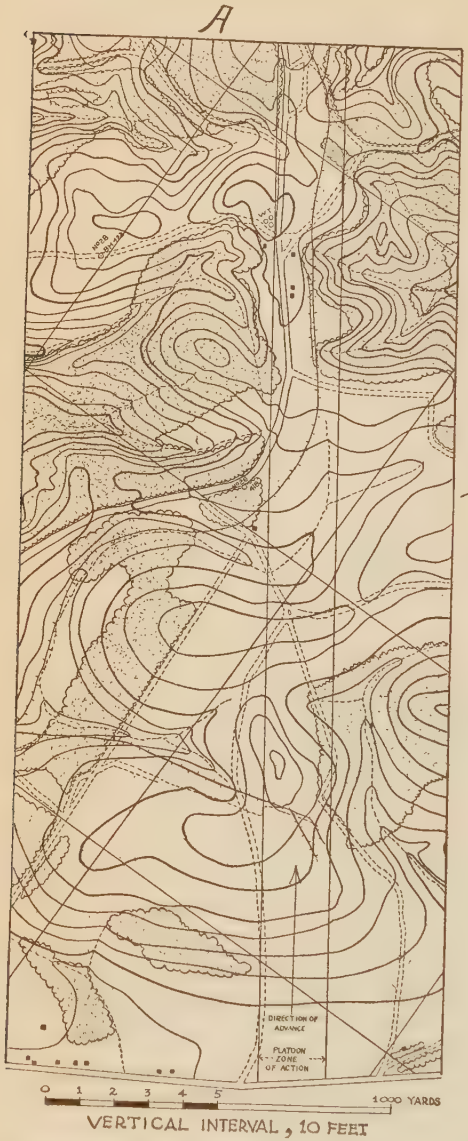


PLATE 64–A.—Reproduction of a section of a map, with platoon zone of action outlined

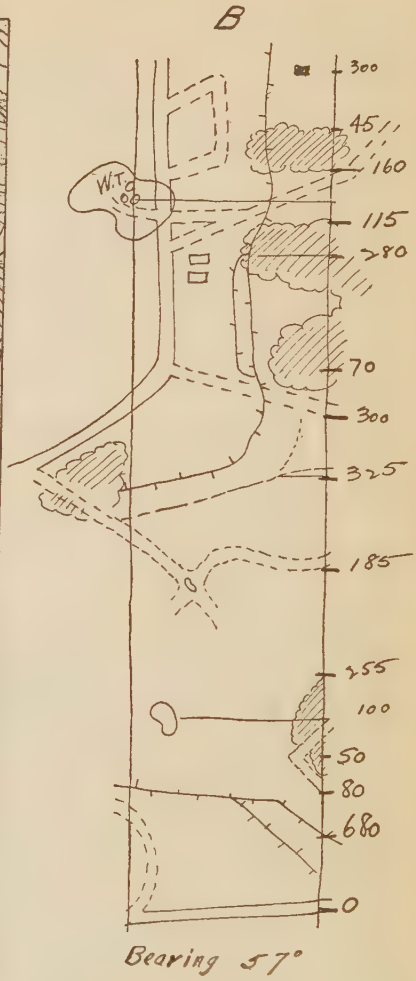


PLATE 64–B.—Hasty sketch made by platoon leader of his zone of action

h. The platoon chief petty officer.—(1) The platoon chief petty officer is the second in command of his platoon. During the approach march his duties are—

(*a*) To carry out the instructions of and to assist the platoon leader in every way possible.

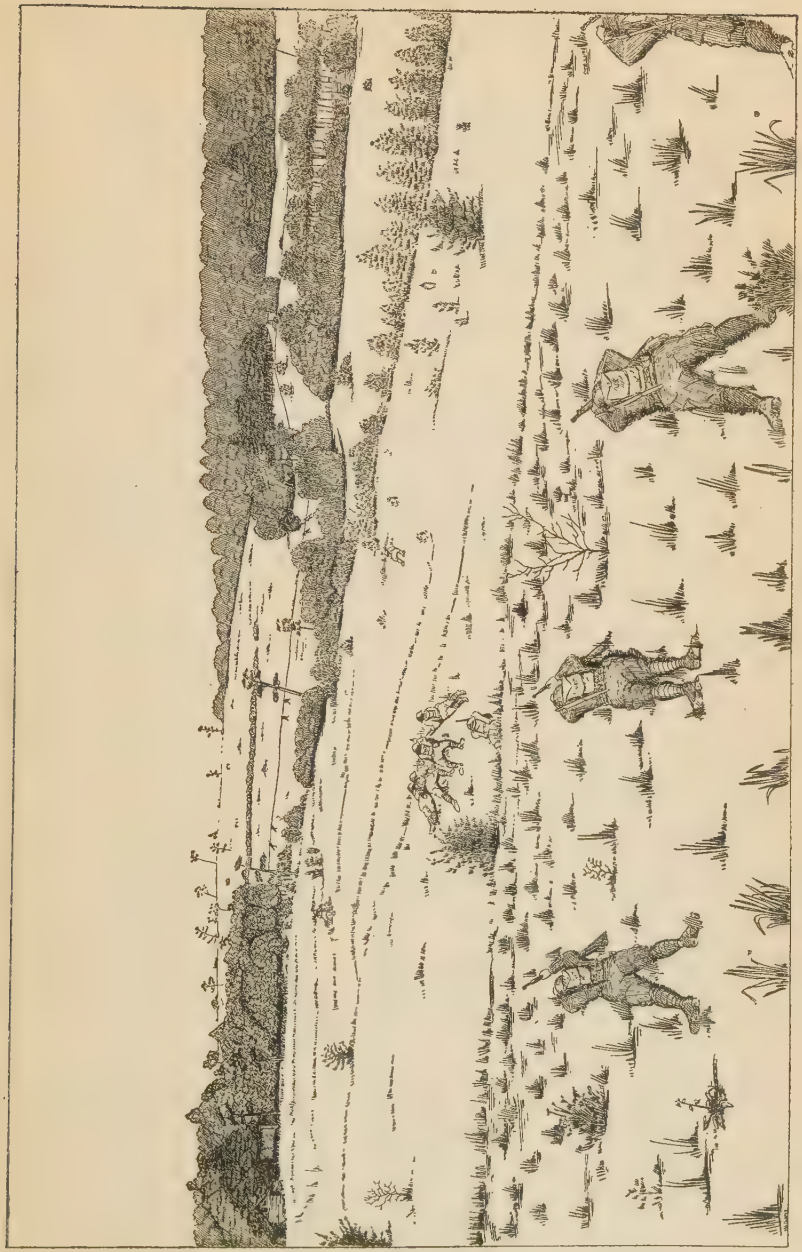


PLATE 65.—Platoon leader assembling leaders to issue orders

(*b*) To replace the platoon leader should the latter become a casualty.

(*c*) To prevent the rear section from merging with the leading section.

(*d*) To keep in touch with platoon headquarters.

(2) The platoon chief petty officer must be ready at all times to assume command of the platoon should the leader become a casualty. This is his primary duty. He is not to be used as a runner nor to be assigned to any other duty which might prevent his taking immediate command of the platoon if necessary.

(3) When the platoon is moving in the approach march, the platoon chief petty officer is between the leading and rear, or right and left, sections.

(4) During halts he remains near the sections, but places himself where he can receive signals from platoon headquarters.

5. The attack.—*a. Company attack order.*—(1) The company attack order will generally be issued at some stage of the approach march, usually at the last available cover before reaching the enemy position.

(2) In emergencies, however, such as when it receives hostile small-arms fire at close range, the platoon attacks without waiting for the company attack order.

(3) The platoon leader upon receipt of the company attack order makes an estimate of the situation (see TR 420–105), calls together his leaders, and issues his preliminary orders.

(4) The platoon leader, at the time designated or upon signal from company headquarters, gives the signal for the platoon to move forward.

b. Action of platoon when fired on.—(1) When fired on, men instinctively want to halt, take cover, and return the fire. To engage in a fire fight at 800, or even 600 yards, gives the defender a decided advantage. When the ground permits, the platoon must be worked forward under cover until the fire of the enemy forces a return of fire in order for the platoon to advance farther.

(2) When the scouts are stopped by fire, the platoon leader goes immediately to a position from which he can see the target and ground to the front. If the platoon can not be worked closer to the enemy without firing, he quickly makes an estimate of the situation with a view to attacking by fire or by fire and maneuver.

(3) If the terrain and the enemy fire permit, the platoon chief petty officer and section leaders are assembled behind cover from which the target can be seen. (See pl. 65.)

(4) Here the leader, pointing out the target, issues his orders. (See TR 420–105.)

(5) Runners are to be sent back with orders only when it is inadvisable to assemble the petty officers.

c. Methods of attack by platoon.—(1) The usual methods of attack by the platoon are:

(*a*) *Straight to the front with both sections.*—(1) When the attack is over open level ground or when units on the flanks are so close as to render any other form impracticable, the platoon usually attacks straight to the front with both sections. The rear section reinforces the firing line by prolonging it. Scouts of the rear section go ahead and determine the initial firing position for the squads of that section.

(2) Every effort must be made to prevent the sections from intermingling.

(3) This method of attack quickly develops the full fire power of the platoon. It has the disadvantage of making known to the enemy the plan of attack and thus loses the effect of surprise. By committing the entire platoon to action the leader is rendered powerless to meet emergencies which call for a supporting group. (See pl. 66.)

(*b*) *Straight to the front with one section while a small group, consisting of an automatic rifleman and two or three riflemen, works to the flank of the target.*—(1) Usually the most effective method for the attack is straight to the front with one section while a small group of a few men from the other section works to a flank of the target.

(2) Small groups working closer to the target attempt nothing in the way of an envelopment. By pushing ahead under cover, as shown in Plate 67, they seek to get nearer the target without swinging far to a flank.

(3) If the ground affords cover for the group, this method of attack gives the greatest chance for success. Two or three determined men using cover can often work up to an enemy position without being seen. A squad is difficult to keep concealed and offers a larger target if discovered.

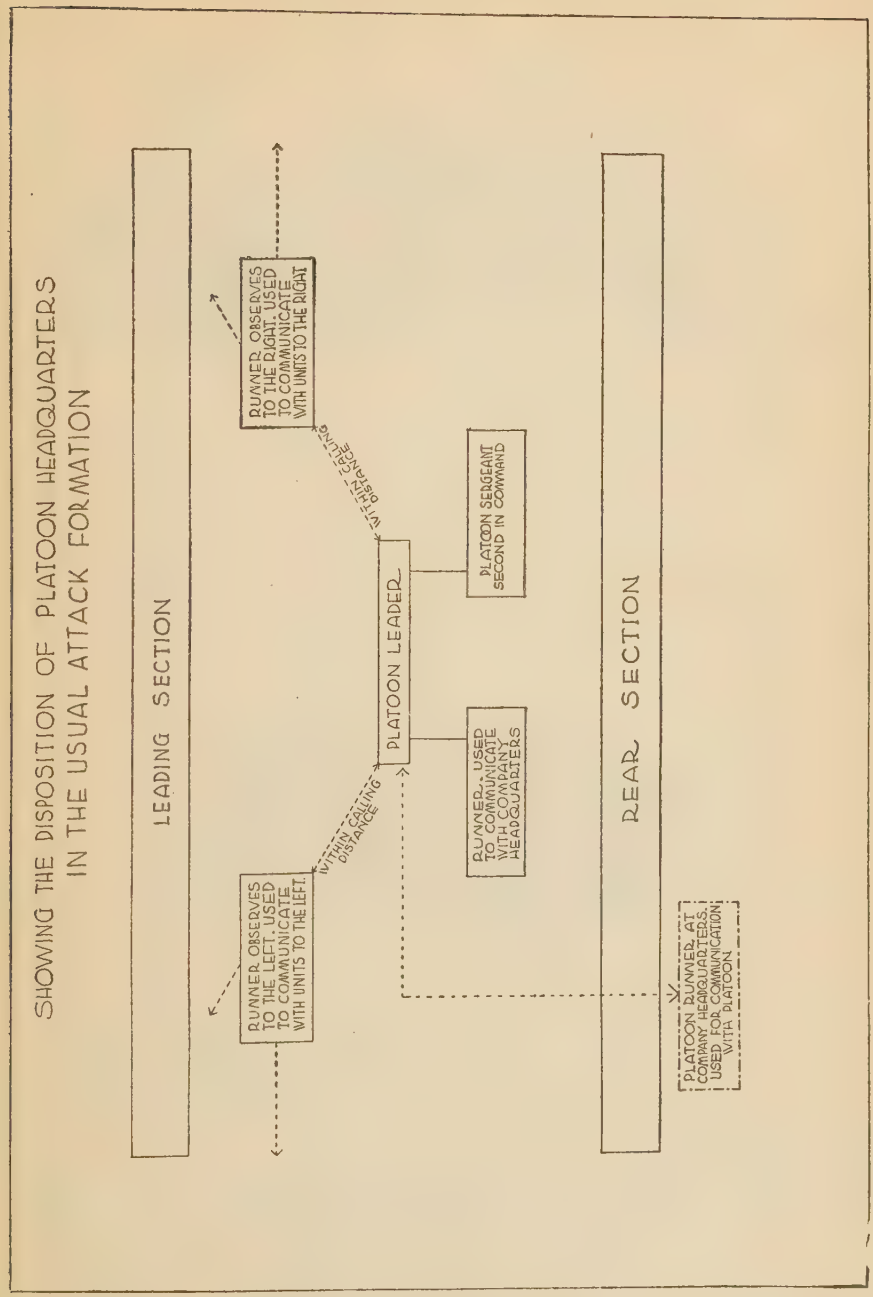


PLATE 66.—Platoon engaged with the enemy

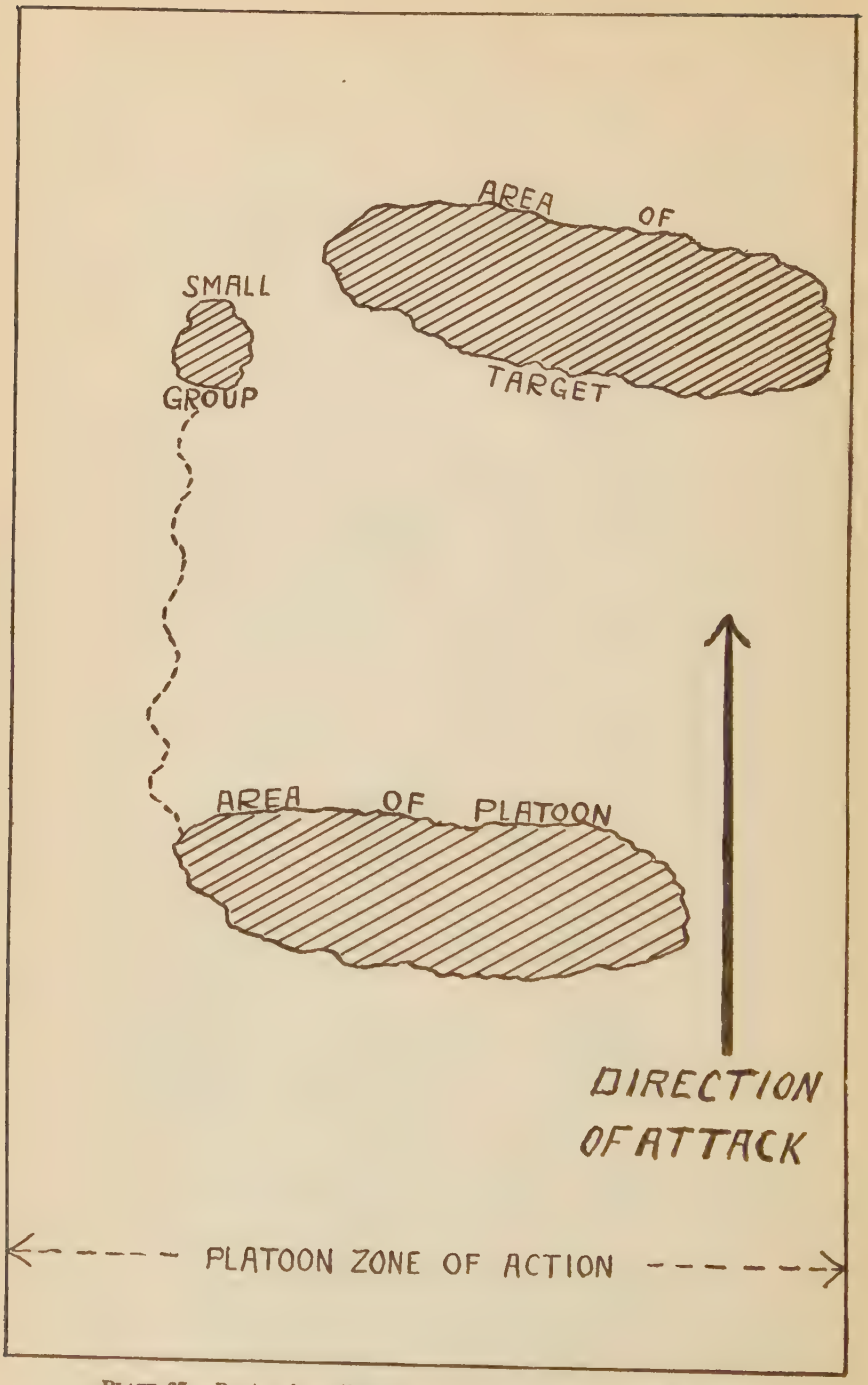


PLATE 67.—Route of small group working to flank of platoon target

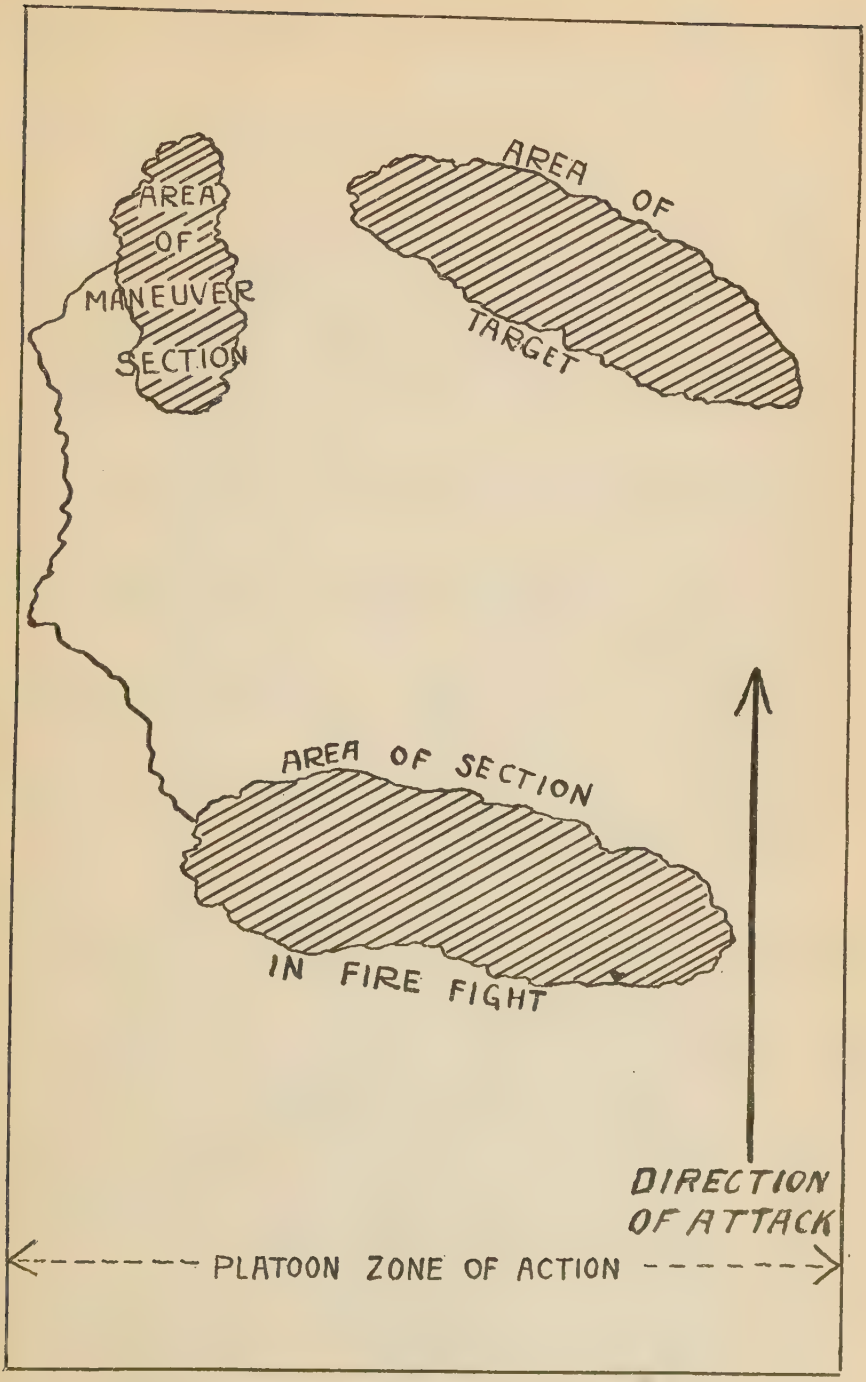


PLATE 68.—Route of section working to flank of platoon target

(4) Should a group be fired on, it works ahead by bounds, one man at a time running from cover to cover. The other men of the group fire. The dogged advance in this manner of even a few men at close range gives the enemy great concern and by attracting his attention enables the remainder of the platoon to advance.

(5) If possible the group works to a position within a few yards of the enemy. This can be done only when the ground affords to the group cover from fire directed at the target by the remainder of the platoon. From this position, heavy fire is opened. If the enemy resists, a few hand grenades are thrown into the position, the automatic continues to fire, and when the grenades have exploded, the position is rushed.

(6) If, as will often be the case, the group can approach no closer than 50 to 200 yards, heavy fire is opened by all men. If the situation then permits, men advance by fire and movement. Otherwise, they continue to fire and the section closes under protection of this and its own fire.

(*c*) *Straight to the front with one section, while the other works closer under cover.*—(1) The ground and character of the resistance will sometimes favor an attack straight to the front with one section while the other, using cover, works closer. From this nearer position the maneuvering section, by its fire, covers the advance of the other section, or under cover of the fire of the latter, closes with the enemy.

2. The great disadvantage of this method of attack is that the enemy will probably have automatic weapons covering routes dangerous to him. The section then becomes involved in a fight of its own, so that the platoon as a unit is ineffective. In this event the company commander must be notified without delay.

3. Men committed to a fire fight can rarely be withdrawn under cover of their fire alone, except with heavy loss. When the platoon is held up with its sections separated and fighting separate targets, it holds the ground occupied and takes advantage of any change in the situation to press closer. In no case does it fall back unless ordered to do so.

(2) *Flanking movements.*—The platoon is essentially a driving unit. Wide flanking movements by any part of the platoon are rarely justified. Maneuvering in the zone of an adjacent platoon is always dangerous. When such action becomes necessary, a runner is sent to the headquarters of the adjacent platoon with detailed information of the maneuver.

(3) *Other methods of attack.*—(a) The platoon may be placed in a situation where the scouts have a poor firing position or can be reached only with probable heavy loss. The leader may then attack:

1. By working the leading section (less scouts) or the rear section, around a flank if the ground is favorable.

2. By working the platoon (less scouts of the leading section) around a flank.

(*b*) The platoon leader in deciding upon a plan of attack must think in terms of men, human beings; not pins or mechanical toys. He must visualize the platoon, see it as a team. He must realize that each part is to be employed with the idea of assisting the other parts. This is teamwork.

(*c*) The methods of attack described above are in no sense rules. They are guides. To succeed, any method must be simple, the simpler the better. Complicated maneuvers offer slight chance for success. Each situation with which the leader is confronted will be different from every other. No one method of attack will be suitable for all. The leader who knows his men and the ground over which he must advance will not go far wrong in his choice of methods.

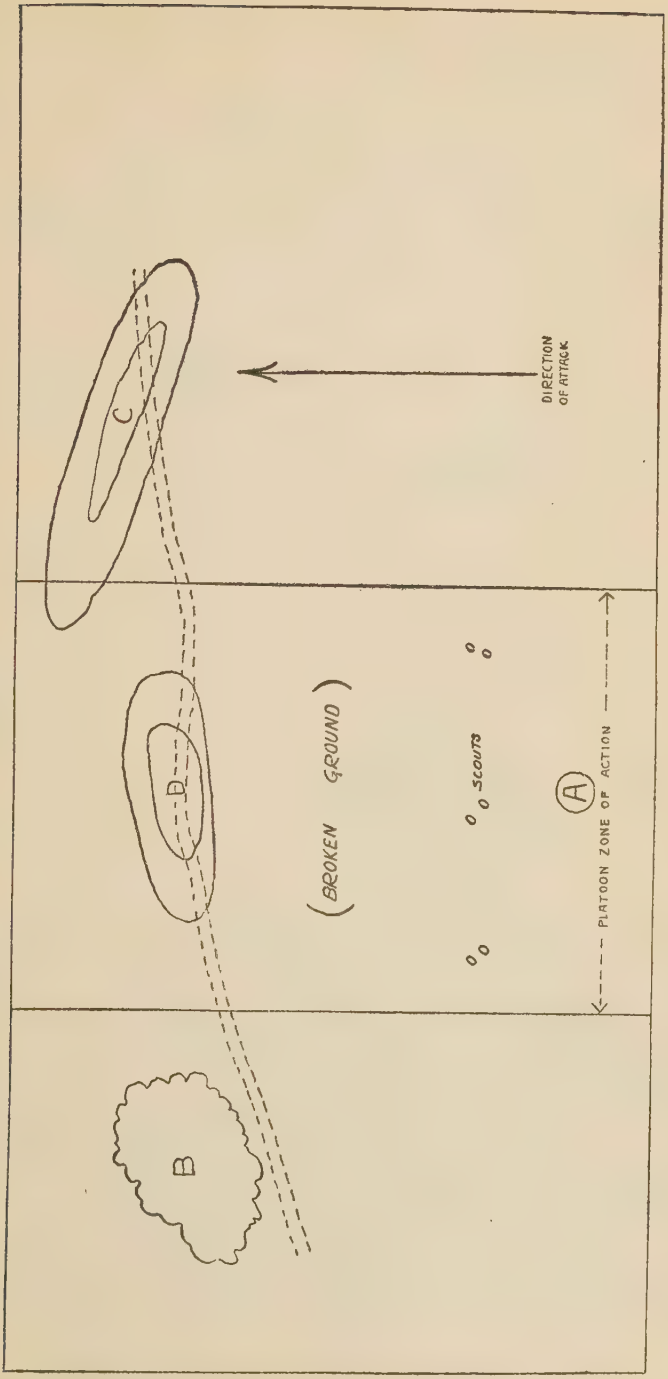
(4) *Position of leader.*—The leader is bound to no fixed post. He moves so as best to observe the progress of the attack. He should never take personal charge of a squad or section. He controls always through his subordinates.

Situation: During a general attack your platoon reached A. Fighting is in progess by platoons on your flanks at B and C. As your scouts reach the position shown, heavy fire is opened on the platoon from D.

Requirement: What is your plan of action (Pl. 69.)

d. Flank protection.—(1) The platoon leader is at all times responsible for the protection of his flanks. In addition to the runners, one or two men in the right and left squads must be designated to look frequently to the right and left flanks, respectively, of the platoon.

(2) Any attempt to keep a general alignment ceases when the unit is held up by enemy fire. During an engagement, inequalities in the resistance met



PROBLEM No. 2

PLATE 69

will enable one platoon to push forward more rapidly than another. On unfavorable terrain it may be necessary for the leader to protect his flanks by sending out small groups consisting of an automatic rifleman and two or three men. No guide can be given. The judgment of the leader must determine for him when to protect his flanks by sending out small groups.

e. Assisting an adjacent platoon.—(1) The best manner of assisting an adjacent platoon is to push forward. When opposite the flank of the resistance, conditions will determine whether the platoon shall continue its advance or halt for the purpose of assisting the adjacent platoon by attacking.

(2) If it is decided to halt, the leading section affords protection to the original front. (See pl. 70.)

(3) The rear section is maneuvered so as to take the resistance in flank.

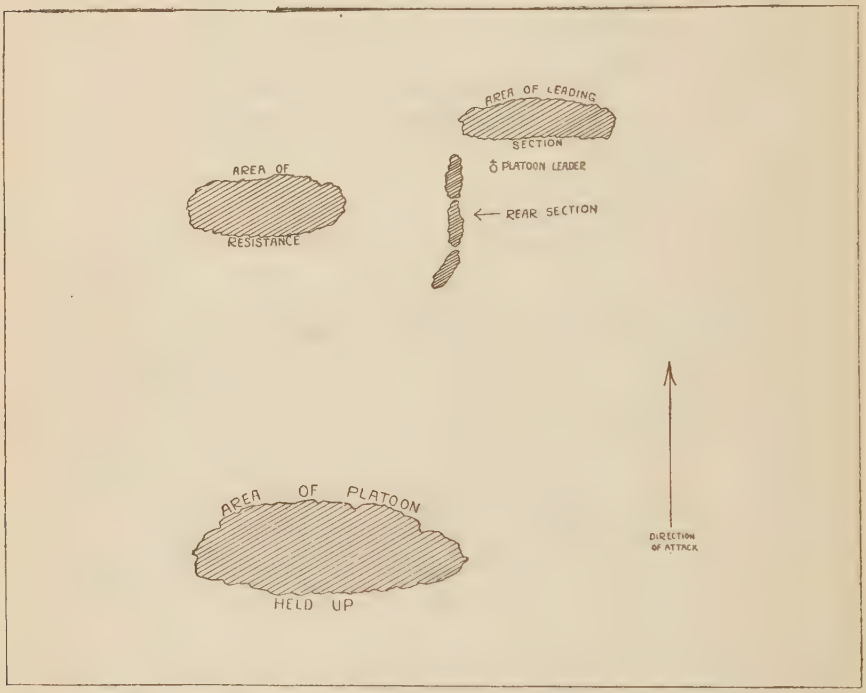


PLATE 70.—Showing a method which may be used in assisting an adjacent platoon

(4) The platoon leader places himself where he can watch the progress of the attack and still be in close touch with the leading section.

(5) After the resistance has been overcome, the platoon is reorganized and the advance resumed.

f. The platoon chief petty officer.—(1) The platoon chief petty officer is a substitute for the platoon leader should the latter become a casualty. When not on a specific duty he must be in close touch with platoon headquarters, be familiar with the leader's plan, and know the situation.

(2) When issuing orders to other petty officers, the leader, if practicable, issues them in the presence of the platoon chief petty officer.

(3) When not at an assembly of petty officers, the platoon chief petty officer should be at least 40 yards from platoon headquarters in order that a single shell may not cause both the leader and himself to become casualties.

(4) He should not be used as a runner. He may be ordered to direct the engagement of the maneuvering section. In this event he does not personally

command the section but employs it as the platoon leader would in making decisions and having them carried out by the section leader.

6. The assault.—(See TR 420–110.) *When the assault is held up.*—If the enemy resistance breaks down the assault, or for any other reason it is temporarily held up, the troops take advantage of shell holes, ridges, and other available cover, or dig in. The platoon leader makes immediate preparations for meeting a counterattack and holding the ground already gained.

7. Reorganization.—*a. Following a rolling barrage.*—When following a rolling barrage in a carefully planned attack, the time for delay at a position will be definite and usually brief. The platoon is hastily reorganized and the barrage closely followed to the next position. Each position, except the final objective, is mopped up by units detailed for that purpose. Assaulting troops clean out the final objective as soon as they occupy it.

b. Without a rolling barrage.—(1) Most attacks will be preceded by artillery preparation, few accompanied by a rolling barrage.

(2) When the assault is not preceded by a rolling barrage, units will be badly disorganized. A disorganized unit becomes ineffective as a combat unit and must be reorganized before it can be used again.

(3) As soon as the position has been taken, the platoon leaders sends out scouts to the front for protection. Sections are placed in depth to meet a counter attack; leaders are replaced; units are regrouped; automatic riflemen and scouts who have become casualties are replaced; ammunition from near-by dead and wounded is collected and redistributed; a message is sent to the company commander giving the effective strength of the platoon; prisoners are sent to company headquarters; the platoon resumes its advance or prepares for defense in accordance with the company plan. (See TR 420–105.)

(4) In the regrouping of units, at least two squads or groups should be organized as a leading section, and a rear group formed, even though the group consists of only a single squad.

(5) The platoon leader gives his orders for reorganization and directs the platoon chief petty officer to supervise. The platoon leader then makes a personal reconnaissance to front and flanks.

Situation: During a general attack your platoon took a position at A. Fighting is in progress by platoons on your flanks at B and C. Seven prisoners were taken. Your platoon has the following casualties:

First section: Section leader; squad leader. 1st squad; rifle grenadier, 1st squad; scout No. 2, 1st squad; second in command, 2d squad; scout No. 1, 3d squad; substitute automatic rifleman, 3d squad.

Second section: Section guide; scout No. 2, 4th squad; second in command, 4th squad; rifle grenadier, 5th squad; squad leader, 6th squad.

Requirement: Give you orders for reorganization. (Pl. 71.)

8. The pursuit.—*a.* When ordered to pursue, the platoon continues to fire on the enemy as long as he is in sight. The platoon then reorganizes and at once pushes rapidly on. Although the platoon must not get so far ahead of the general line as to be in danger of isolation, no attempt to keep aligned is made while resistance is being offered by the enemy.

b. Pursuing forces must at all times be prepared for a counter attack. The flanks are particularly vulnerable. Men are detailed especially to watch the right and left flanks.

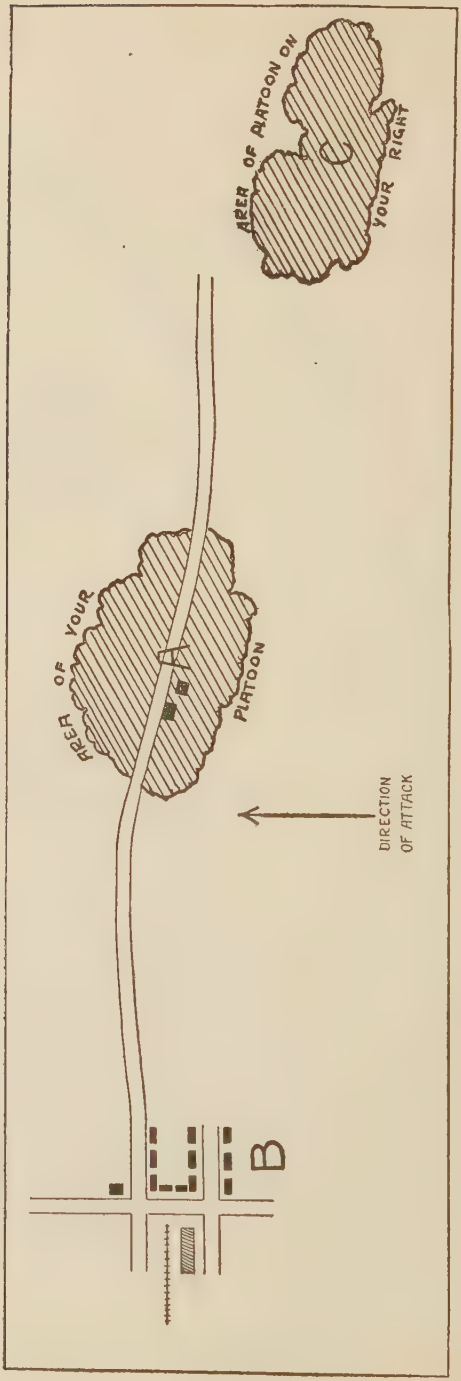
c. The platoon may be deployed in depth or in line, depending on the character of the enemy and the nature of the resistance. When pursuing an organized capable enemy, the platoon is disposed in depth. If the resistance has been weak and is badly broken, the platoon may be in line.

9. Organization of ground.—See Section II.

10. Resisting counterattack.—See Section II.

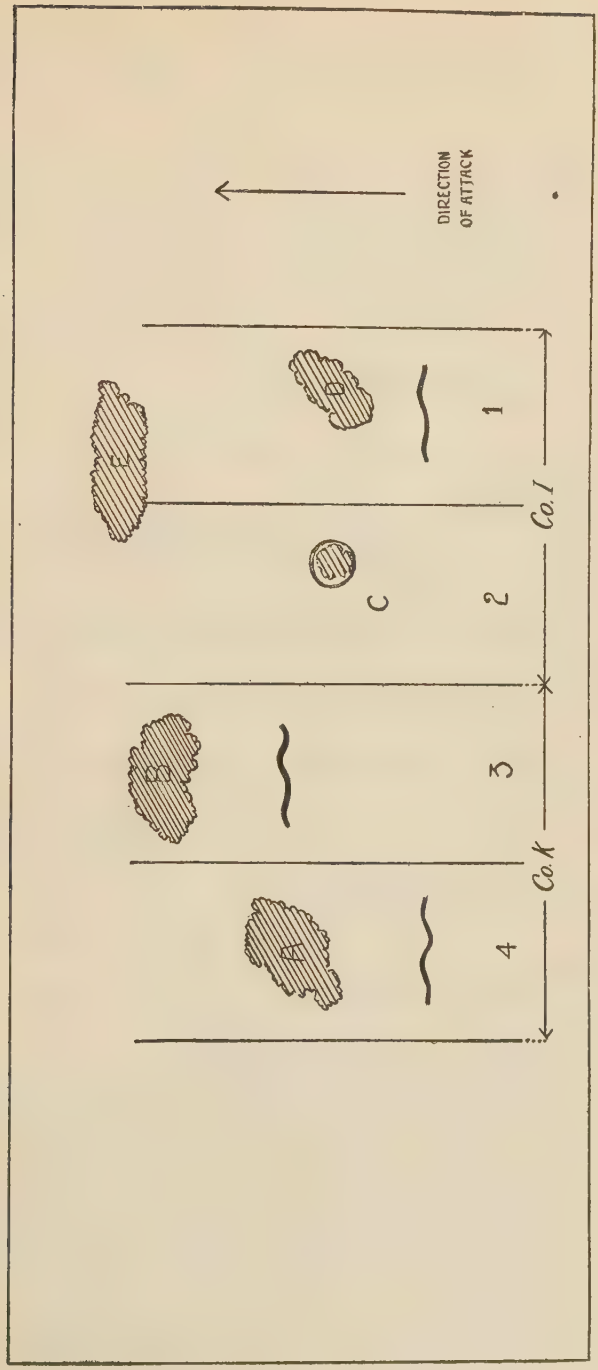
Situation: In a general attack enemy resistance has been developed at A, B, C, D, and E. Your platoon, advancing in the zone marked "2," took the position C.

Requirement: What is your plan of action? Why? (Pl. 72.)



PROBLEM No. 3

PLATE 71



PROBLEM No. 4

PLATE 72

Section II.—PLATOON IN DEFENSE

	Paragraph
General principles	11
Mobile situations	12
Stabilized situations	13

11. General principles.—*a. Employment of a platoon of a first-line company.*—A platoon of a first-line company thrown on the defense may be employed as—

(1) An outguard.

(2) A holding garrison on the line of resistance. (Combat platoon.)

(3) A support. (Reinforcing or counterattacking platoon.)

b. Duties of the platoon as an outguard.—The duties of the platoon as an outgard are discussed under the subject of "Outguards," Section VI.

c. Definitions.—(1) A combat platoon is one which holds part of the line of resistance in a main battle position or in an outpost line.

(2) A support platoon is one which occupies a position on the next line in rear of the line of resistance and in a main battle position or in an outpost line.

d. Weapons of platoon leader.—(1) To fire on targets appearing above ground and not behind cover the platoon leader has—

(*a*) Automatic rifles.

(*b*) Rifles.

(2) To fire on targets beneath ground or behind cover he has—

(*a*) Rifle grenades.

(*b*) Hand grenades.

(3) Rifle and hand grenades are the most valuable in defense.

e. Distribution of rifle units.—(1) In order to lessen the number of casualties from enemy artillery and trench mortar fire the rifle units are distributed along the line in groups of 4 to 8 men.

(2) Each group is under the control of a designated petty officer.

(3) The group commander stations himself where he can conduct the fight of the group and at the same time remain in close communication with the next higher commander.

(4) The interval between groups must not exceed 150 yards.

(5) For close defense the area organized is usually not greater than 75 by 150 yards.

(6) In hilly or thickly wooded country the frontage which a platoon can defend is much less than in open country. A division of the platoon is exceptional.

f. Plan of defense.—(1) A plan of defense, based on the company plan, knowledge of the ground and the enemy, will be prepared by each platoon leader.

(2) Such a plan includes a consideration of—

(*a*) Probable points of enemy attack.

(*b*) Points from which resistance is to be offered and strength of groups to hold them.

(*c*) Preparation of counterattack.

(*d*) Communications, supplies, disposition of casualties, liaison, and observation.

12. Mobile situations.—*a. Deployment for defense.*—(1) The time available is the governing factor in the method of deployment.

(2) The combat platoon deploys for defense on one or two lines.

(3) When separated from the company and organizing for defense, the platoon deploys on two lines. This deployment is best for all-around defense.

(4) As part of a company, each section in the first line must be so disposed as to cover with fire its own front, intervals to the right and left, and the fronts of adjacent groups. Each section in rear of the first line must cover its own front, intervals between near-by sections, and the flanks of the sections to the front. (See pl. 73.)

(5) In open country a platoon can defend with its fire a frontage of approximately 400 yards. The platoon occupies physically only a small part of this front. The remainder is covered by fire.

(6) The platoon covers its area in open country by organizing as a single group or by dividing the platoon into two groups. When the platoon includes two groups, they are disposed so as to cover all ground to the front and to afford mutual support. (See pl. 74.)

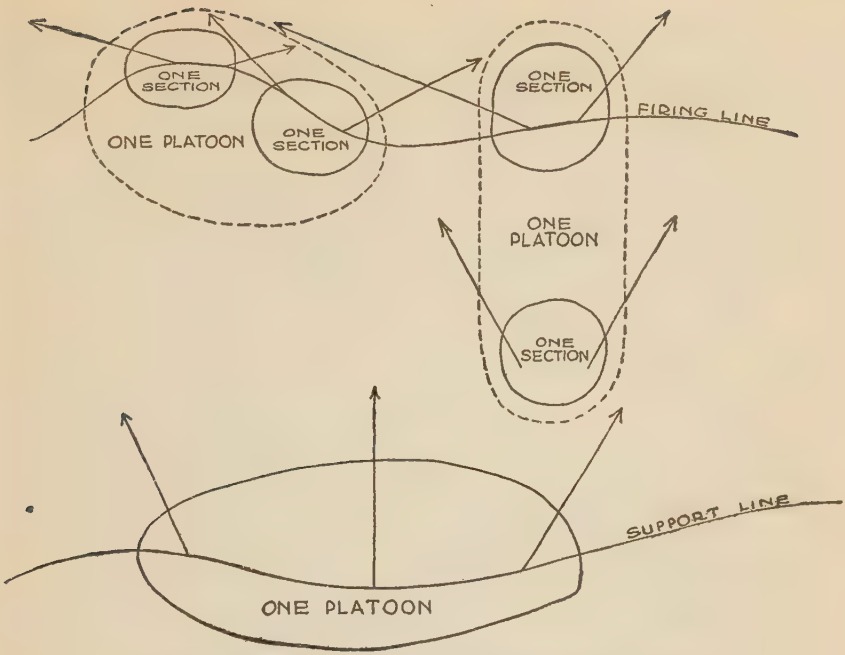
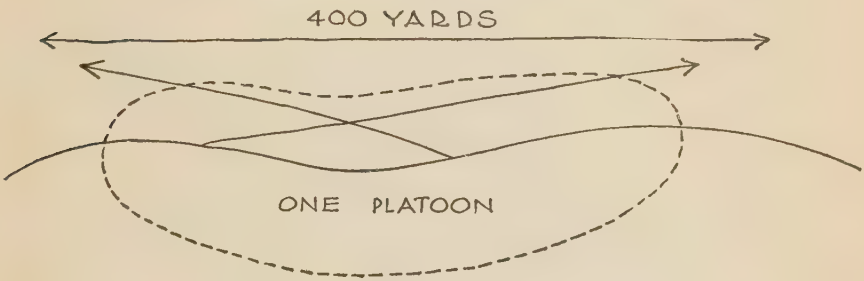
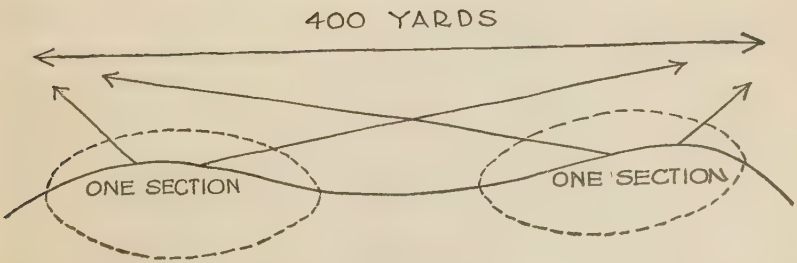


PLATE 73.—Sections disposed in defense for mutual protection



A



B

PLATE 74–A.—Platoon as one combat group
PLATE 74–B.—Platoon as two combat groups

(7) The platoon is distributed so that a maximum amount of effective fire can be delivered to the front and flanks. Exceptionally, it may occupy a single line either parallel or perpendicular to the front. Usually, the platoon is so located as to include parts of lines both parallel and perpendicular to the front.

b. Obstacles.—(1) The combat group should be surrounded by obstacles placed so as to check the hostile advance under effective fire, and so as not to disclose the disposition of the group.

(2) Cover for riflemen and grenadiers should be so located that the automatic rifles will be protected and interference with their service prevented.

c. Emplacements.—(1) Concealed emplacements are prepared for fire to the flanks of the platoon. They are used only in repulsing the enemy during the last minutes of his attack. They are sited slightly in rear of the front trench

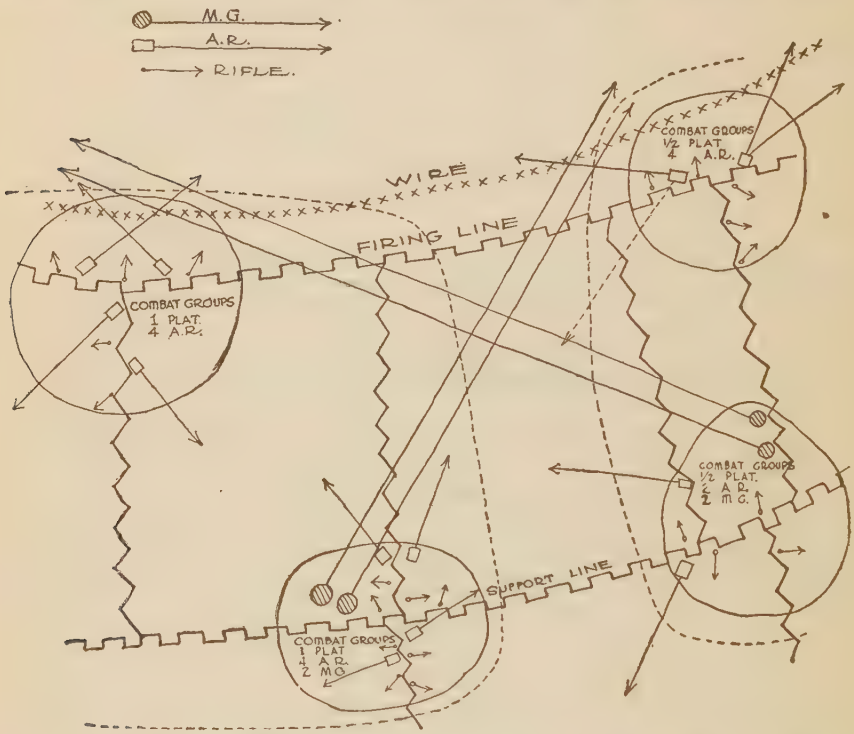


PLATE 75.—Platoons disposed so as to obtain maximum fire effect to front and flanks

or line so that their fire will not be affected by the remainder of the platoon when repelling the attack. (See TR 420-105.)

(2) Well-camouflaged emplacements at least 30 yards in rear of the firing line and at least 30 yards from approaches afford best protection against trench-mortar and one-pounder fire.

d. Cooperation with machine guns.—(1) The rifle units constitute the framework around which the plan of defense is built.

(2) They must cover all dead space in the bands of supporting machine-gun fire up to a distance from the front line of 500 yards. Changes in the first dispositions of rifle units will often have to be made in order to accomplish such purpose.

Situation: Your platoon is an assault element of a large force attacking due north. You are platoon leader. Following a general advance of several miles, your platoon, which had been part of a reserve element, was ordered forward. You were directed to prepare at once for defense the area indicated

by a dotted line at "A." The platoon on your right is organizing at "B," the platoon on your left at "C."

Requirement: (*a*) How will you dispose your sections?

(*b*) How will you dispose the squads in each section? (Pl. 76.)

PROBLEM No. 5

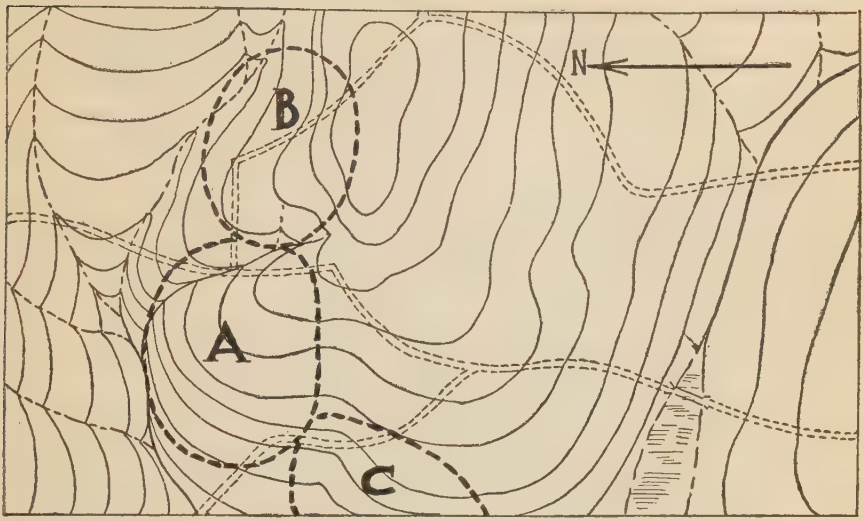


PLATE 76

e. Organization of the ground.—

(1) The leader receives—

(*a*) Location of his sector.

(*b*) Limiting points of his sector.

(*c*) His sector of fire.

(*d*) Location of supporting machine guns and their sector of fire.

(*e*) Location of units on his right and left.

(2) He then plans on the ground—

(*a*) His dispositions. (One or two groups.)

(*b*) Details of siting and constructions.

1. Exact positions of automatic rifleman and marking out the limits of their sectors of fire.
2. Location of obstacles.
   - (*a*) Obstacles are concealed, if possible.
   - (*b*) Obstacles are located to avoid disclosing location of group.
   - (*c*) Obstacles are placed so that the ground in front of them will be enfiladed by the fire of automatic rifles.
3. Tracing of the fire trench.
   - (*a*) The fire trench must accommodate the unit to occupy it. Such disposition requires at least 5 lineal feet per man.
   - (*b*) It must protect machine guns from attack.
   - (*c*) It must cover dead space in bands of machine-gun fire.
4. Construction of the fire trench.
5. Construction and placing of obstacles. Of hastily constructed obstacles, concealed wire entanglements on the front and flanks of the group at a distance of about 50 yards, will give the best protection.

6. Selection of openings in wire to be used in case of counterattack.
7. Clearing the field of fire.
   (*a*) Especially important if the position is in woods.
   (*b*) Only the small underbrush and small trees are cleared out. Large trees are left standing to prevent such clearings from being seen by the enemy at a distance.
8. Selection of command post for the group leader.
   (*a*) The command post must have observation to front and flanks.
   (*b*) It must be hidden from hostile view.
   (*c*) It must afford quick communication with all parts of the group.

f. Preparation of the ground.

(1) When time permits, the group is divided into reliefs. Each relief is assigned a definite task on which it works until such task is completed. The remainder of the platoon is held at rest in a position of readiness.

(2) When cover must be obtained quickly each group deploys on the trace of its combat emplacement and digs in at once.

(3) In daylight, when an assault platoon has been stopped and is compelled to dig in at once, men remain beneath the ground and work toward each other. (See TR 420–105.)

(4) At night or when protected from enemy observation the relief method of paragraph (1) above is used.

(5) The first steps to be taken in the hurried preparation of a position are, in order of importance:
   (*a*) To get protection to the front and flanks. Autoriflemen, scouts, or some of both are used.
   (*b*) To get cover. Fox holes are dug, or such cover as shell holes, ditches, or embankments is used.
   (*c*) To get obstacles in front of positions, on flanks, and in rear.
   (*d*) To clear field of fire to front and flanks.
   (*e*) To determine ranges to prominent points in foreground and to flanks.
   (*f*) To connect fox holes.

g. Other duties of the platoon leader in connection with defense.

(1) Assures himself that there is an adequate supply of ammunition at hand. Provides depots and niches for the storage of ammunition.

(2) Familiarizes himself with the location and fire sectors of machine guns and light mortars covering his front. Gets the location of the post of the nearest artillery observer.

(3) Selects in his area and in adjoining areas the points which afford best observation to his front and flanks. He details observers and provides a permanent or semipermanent observation service for his platoon.

(4) Studies ground to the front and flanks.

(5) Instructs his unit leaders as to details of the terrain, roads, villages, streams, ravines, or woods. Gives these leaders the location of the battalion first-aid station and the command posts of the platoon, company, and battalion.

(6) When it is not necessary for all men to occupy combat emplacements constantly, the platoon leader protects his unit by posting sentries and holds the remainder of the platoon in readiness, at rest. Each combat group posts at least one sentry (double or single). One petty officer shall at all times be on duty within the platoon.

(7) The platoon leader is responsible that each man is familiar with the emplacement he is to occupy in case of combat or alarm, and that the whole position can be easily manned.

h. The counterattack.

(1) The best defense is to attack. If the enemy penetrates his position, the platoon leader attacks at once without orders.

(2) If the platoon is deployed on one line, troops for the counterattack will come from the support platoon. When the platoon is deployed in two lines, troops of the rear line make the counterattack. Such troops may be assisted by elements from the support platoon, but must be prepared to fight alone.

(3) A successful counterattack depends on three factors:

(*a*) Time when delivered. The enemy must be attacked the instant he enters the position. Delay gives him time to reorganize. Troops which have just captured a position are disorganized. A quick rush with the bayonet will drive the enemy out, though he is in greater numbers.

(*b*) Knowledge by each man of the part he is to play. Each man should know where he is to go and what he is to do.

(*c*) Determination on the part of troops counterattacking to drive the enemy back. Each man must understand that the enemy is disorganized, is in a position with which he is not familiar, and if attacked *at once* with determination can be dislodged and driven back.

(4) Troops of the rear line may be used to counterattack an enemy who has entered an adjacent platoon area. This will ordinarily be provided for in the company plan of defense. In any event, all men of platoons concerned must know what is to take place.

i. Direction of counterattack.—The rear group of the platoon counterattacks straight toward the enemy. The company plan may call for an attack against the enemy's flank by an adjacent unit or by the support platoon. (See Sec. III.) Such plans are made known, ahead of time, to all men of the platoon.

13. Stabilized situations.—*a. Duties of leader before going into line.*—When a platoon is notified that it is to be called for duty in the trenches, the leader, by inspection, assures himself that the arms, equipment, and clothing of his men are in good condition and that ammunition, rations, and kits are as prescribed by orders.

b. Making the relief.

(1) A relief of troops in position warfare usually takes place at night.

(2) The platoon leader takes one of his runners and with the company commander goes to the post of command of the outgoing company commander, where he studies the plan for defense of the area.

(3) With his runner and a guide furnished by the outgoing company, he then goes to the post of command of the outgoing platoon leader whom he is to relieve.

(4) The runner is sent to join the incoming company commander. The guide returns to his company post of command.

(5) The platoon leader (incoming) receives from the outgoing platoon leader an extract of the plan of defense.

(6) This extract includes—

(*a*) Precise rôle of each combat group. For example: To sweep with fire a sector of the ground in the front or flank of an adjacent element.

1. A detailed sketch of the dispositions.
2. A detailed sketch of the enemy trenches.

(*b*) The rôle of adjacent platoons.

1. The means of communication with adjacent platoons.
2. The means of communication with the company commander.

(*c*) Plan of work. A position can always be improved. New work or the improvement of old work must constantly go on.

(7) The two platoon leaders then make a tour of the trenches. During daylight, the incoming leader makes a detailed reconnaissance of the platoon area and enemy front.

(8) He obtains from the platoon leader of the outgoing platoon and by personal inspection verifies the following:

(*a*) Conduct and habits of the enemy, strength of enemy obstacles, location of enemy posts, machine guns, trench mortars; mining activities, information of enemy patrols.

(*b*) Lie of enemy artillery barrage and gaps in same.

(c) Points in own line exposed to fire of hostile snipers.

(*d*) Location, nature, and capacity of shelters.

(*e*) Location of friendly machine guns, their sectors of fire and the dead ground in these sectors.

(*f*) Lie of artillery barrages in front of his position. Signals for starting and stopping these barrages.

(*g*) Location of nearest artillery observer.

(*h*) Location of nearest aid station and route thereto.

(*i*) Defensive measures against gas attack and alarm system therefor.

(*j*) Accessory defenses and hidden passages through the barbed wire. Gaps in enemy wire.

(*k*) Location of supporting mortars and their fire.

(*l*) Arrangements for supplies.

1. Water.
2. Small-arms ammunition.
3. Grenades.
4. Sandbags.
5. Wire.
6. Flares.
7. Other supplies.

(9) The leader of the outgoing platoon is responsible that the incoming platoon is conducted to the area it is to occupy.

The commanding officer of the outgoing organization will usually designate a point of assembly for the guides who are to lead the platoons of the incoming organization to their respective areas.

The leader of the outgoing platoon sends to the assembly point for the incoming company an enlisted man (usually a platoon guide) who is thoroughly familiar with the area and with routes leading to the area. The leader of the outgoing platoon directs this guide to conduct the incoming platoon to a designated point in the platoon area.

The guide is then directed to go with the leader of the incoming platoon to the assembly point for guides. This ends the reconnaissance of the incoming platoon leader. As the relief will ordinarily not take place for several hours, the guide then generally returns to his platoon along the route to be followed by him during the relief.

At the fixed hour he repairs to the designated point of assembly. When the incoming platoon arrives, he places himself at the head of the platoon column and conducts it to the designated point in the platoon area of defense.

At this point, guides for each combat group meet the incoming platoon and conduct the incoming groups to the sites of the corresponding combat groups of the outgoing platoon.

c. Arrival of platoon in line.—(1) When the platoon arrives in the line, the leader assigns his units and these take their places. The relief of the outgoing platoons begins at once.

(2) The leader of the outgoing platoon is responsible that no man leaves his place until the member of the incoming platoon who is to replace him is posted and is thoroughly familiar with all of his duties while so posted.

(3) The incoming platoon leader, as soon as he has taken over his position, reports that fact to his company commander.

(4) The outgoing platoon leader marches his platoon out when so ordered by his company commander.

(5) The outgoing platoon leader is more thoroughly acquainted with the situation. If the enemy attacks during a relief, he takes command of both platoons, regardless of rank.

d. Preparations for relief by outgoing platoon.—(1) The outgoing platoon makes its preparations for departure before the hour of relief.

(2) All camp matériel is taken out by the platoon.

(3) Grenades and cartridges in excess of the quantity prescribed to be carried on the person are left in the proper storage place.

(4) A list of trench stores on hand is prepared by the outgoing platoon leader. The incoming leader checks the list.

(5) Trenches, shelters, and latrines are left absolutely clean.

e. Instructions of men of incoming platoon.—The platoon leader informs his men regarding—

(1) Parts of trenches exposed to fire of hostile snipers.
(2) Firing or assembly positions of men of platoon.
(3) Their duties in case of attack.
(4) Location of cartridge niches, grenade stores, latrines.
(5) Special instructions not included in the foregoing.
(6) Location of platoon, company, and battalion posts of command, and of the battalion aid station. Routes to these.

f. Listening posts.—By means of listening posts, placed just inside friendly wire, warning is given of raids. With reliable men in the posts, the remainder of the platoon not on duty can rest, knowing that they will not be surprised in their shelters.

The very important duty of occupying these posts is dangerous. The best men of the platoon are employed. Each post is placed under the command of a capable, efficient petty officer.

The groups are posted by the platoon leader in person.

Each post is supplied with flares. A klaxon horn, gong, or similar device for giving the gas alarm is furnished each post. Men carry rifles.

Alternate posts are constructed and the same posts never occupied on two successive nights.

g. Inspections by platoon leader.—The platoon leader inspects the position as soon as it has been manned by his platoon. He assures himself that each section, squad, and group leader understands his orders and that all parts of the platoon are in readiness for defensive action.

h. Plan of defense.—The plan of defense in force at the time of relief continues in force during at least the first night the trenches are taken over. The platoon leader, after taking over, makes a personal reconnaissance and submits to his company commander any change he believes should be made.

i. Rosters.—(1) The platoon chief petty officer keeps a roster of the platoon.

(2) Details for carrying parties, ration parties, working parties, and all similar details should be by roster. All men ought to receive approximately equal periods of rest and duty.

(3) Each combat group details its own sentinels, except when all elements of the platoon are sheltered close together.

(4) Men are warned for duty and told when the duty is to commence.

(5) A bulletin board should be established and used for the posting of all platoon orders.

j. Stand-to.—(1) One hour before daylight and at dusk all officers and men go to their posts. These formations are called, respectively, morning and evening stand-to.

(2) At the morning stand-to ammunition expended during the night is replaced.

(3) At the evening stand-to rifles, equipment, and ammunition are inspected and the firing position of each man is tested to see that friendly wire is covered. All gas defense measures are inspected and alarm apparatus tested.

k. Practice alerts and alarms.—(1) The platoon leader holds frequent practice alerts and gas alarms.

(2) The prompt issue of the troops from their shelters, the manning of the firing or assembly positions, and preparation for counterattack are practiced.

(3) In case of fog or darkness, sentries are posted in the gallery entrances to insure prompt egress of the troops within.

l. Routine duties of supply.—(1) The platoon leader makes provision for heating the soup and coffee.

(2) Empty cartridge cases are collected in a platoon dump. Grenades and rockets are placed in sandbags and stored in niches near sentry posts or barricades.

(3) Tools and all trench matériel not in actual use are stored in a small platoon matériel dump.

m. Duties of the platoon chief petty officer.—(1) The platoon chief petty officer is at all times kept informed as to defensive measures of the platoon.

(2) The duties of the platoon chief petty officer are—

(*a*) To carry out the orders of the platoon leader and assist him in every possible way.

(*b*) To replace the platoon leader should he become a casualty.

(*c*) To learn thoroughly the plan of defense for the platoon.

(*d*) To supervise assembly and assignment of fatigue parties.

(*e*) To keep the duty roster.

(*f*) To assign men to shelters.

(*g*) To supervise:

1. Feeding.
2. Sanitation.
3. Care of equipment and stores.
4. Execution of standing orders.

Section III.—SUPPORT PLATOON

	Paragraph
Description	14
Approach march	15
Support platoon in attack	16
Support platoon in pursuit	17
Support platoon in defense	18

14. Description.—When troops with a three-platoon company organization are distributed in depth for an advance, one platoon follows the assault echelon. This platoon is called the *support platoon.* In a four-platoon company, a support platoon usually follows each platoon of the assault echelon.

In an exceptional case, three platoons may be placed in the assault echelon and only the fourth held out as support.

15. Approach march.—*a. Reference to Section I.*—All that is said in Section I concerning the organization, advance in route column, approach march, and in the attack under methods of attack by platoon, flanking maneuvers, other methods of attack, flank protection, the platoon chief petty officer, the assault, reorganization, and pursuit, apply also to the support platoon.

b. Formations.—Support platoons march in squad columns or section columns. The formation to be used depends upon the nature of the country and effect of hostile fire. That formation is proper which will reduce casualties to a minimum.

c. Distance from assault echelon.—(1) The leader of a support platoon is usually informed in orders of the distance his unit is to follow the assault echelon. The distance thus indicated will vary from 100 to 400 yards. He is to consider these limits as guides only, and not as distances to be exactly maintained.

(2) The support platoon must always be so close to the elements of the assault echelon that the latter can not be defeated before the support platoon can lend aid.

(3) It must be so far to the rear that hostile fire can not neutralize its action.

(4) The platoon must not go so far from its axis of advance that runners coming back from company headquarters will have difficulty in locating it.

(5) The platoon moves by bounds from cover to cover, leaving cover (except in open country) only after the assault echelon is in possession of the cover ahead. In open country this type of movement will not be possible. In all cases the judgment of the leader must determine for him when to stop and when to go forward.

d. Position of platoon leader.—The leader remains with his platoon in order to be ready for instant action to front or flanks.

e. Contact with assault elements.—He sends ahead scouts to keep himself informed of the situation. He remains constantly in observation.

f. Protection of flanks.—The platoon leader is responsible at all times for protection of his flanks. Even though the nearness of adjacent units may afford sufficient protection, or security groups may have been sent out by higher commanders, nevertheless, the platoon leader alone is responsible that his flanks are secure.

g. Use of cover.—Following generally its axis of advance, the platoon utilizes ravines, hills, embankments, and other cover as protection against hostile fire.

16. Support platoon in attack.—*a. General.*—The support platoon is the maneuver element of the company commander.

b. When held up.—(1) When one of the assault elements is held up or when both are, the leader of a support platoon sends small patrols to reconnoiter to the flanks. For this purpose he uses scouts.

(2) He places his platoon under cover or causes it to lie down. Using his glasses, he observes closely to the front and flanks. Moving the platoon, if necessary, he takes up a position from which he can promptly reinforce the forward echelon or protect its flanks, or where he can resist if it is driven back.

c. Usual missions of a support platoon.—(1) The most usual missions which will be given a support platoon are—

(*a*) To reinforce the assault echelon.
(*b*) To occupy gaps in the line.
(*c*) To furnish security to a flank of an assault platoon.
(*d*) To assist adjacent units which are held up.
(*e*) To furnish protection during reorganization of the assault echelon.
(*f*) To relieve a platoon of the assault echelon.
(*g*) To mop up a position taken and passed by the assault echelon.

(2) *Reinforcing the assault echelon.*—(*a*) Except under most unusual circumstances, such as a surprise attack on the assault echelon from its flank, the support platoon leader holds his unit in readiness and waits orders from his company commander before undertaking any maneuver.

(*b*) When directed to reinforce the assault echelon, he assembles his leaders and scouts, points out the target to them, indicates the general position and extent of the firing line or the route of advance, and issues the rest of his orders.

(*c*) When a firing position is indicated, the sections work forward to the position, each squad forming on its scouts.

(*d*) The platoon is thereafter conducted in the same manner as an assault platoon.

(*e*) The company plan may require only one section to be placed on the line, the other being held free for maneuver.

(*f*) The company plan may call for a forward movement of the entire platoon, with a view to flanking the resistance. The platoon, preceded by its scouts, and with its flanks protected, then works to a position from which the resistance can be attacked on flank.

(3) *To occupy gaps in the line.*—(*a*) During combat, units in the assault echelon frequently become separated. The support platoon may be called upon to occupy, or move so as to command, the interval. Or it may have to send small groups forward for this purpose.

(*b*) The platoon leader acts without waiting for orders when confronted with an unforeseen situation. In so doing, he assumes full responsibility.

Situation: The assault platoon at B, after a fight which has lasted for some time, has been unable to move forward. The platoon at A has just overcome the resistance there and is cleaning up. A gap now exists between A and B. The company commander decides to send his support platoon, which is at C, to occupy the gap between A and B. You command the support platoon.

Requirement: What orders do you give? (Pl. 77.)

(*c*) The conduct of the platoon, when occupying a gap in the line, differs in the details of execution for each situation.

(*d*) Scouts precede the leading elements. The platoon is held in a formation which will permit easy and rapid deployment to front or flanks. The leader remains well forward to deal promptly with any unexpected developments.

(4) *To provide security for the flanks of an assault platoon.*—(*a*) The support platoon may be called upon to furnish protection for a flank or for both flanks of the assault echelon. This will be the case most frequently during a fight.

(*b*) When the assault echelon becomes engaged, the leader of the support platoon sends to the flanks patrols of two or three scouts each, with a view to having them locate avenues of advance. These patrols make a hasty reconnaissance and report back promptly to their platoon leader. He then has guides familiar with the ground to precede any group which may be sent to protect a flank of the assault echelon.

(*c*) So long as part of the platoon is held back as a support, the leader remains with it. When the platoon is divided, the leader, unless otherwise ordered, goes where his presence appears to be most needed.

PROBLEM No. 6

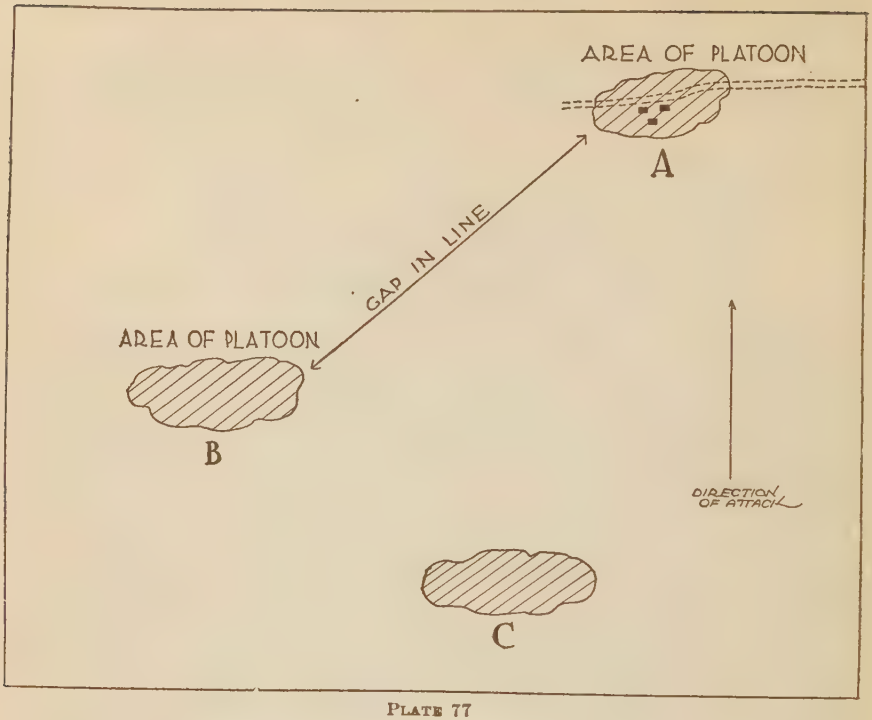


PLATE 77

PROBLEM No. 7

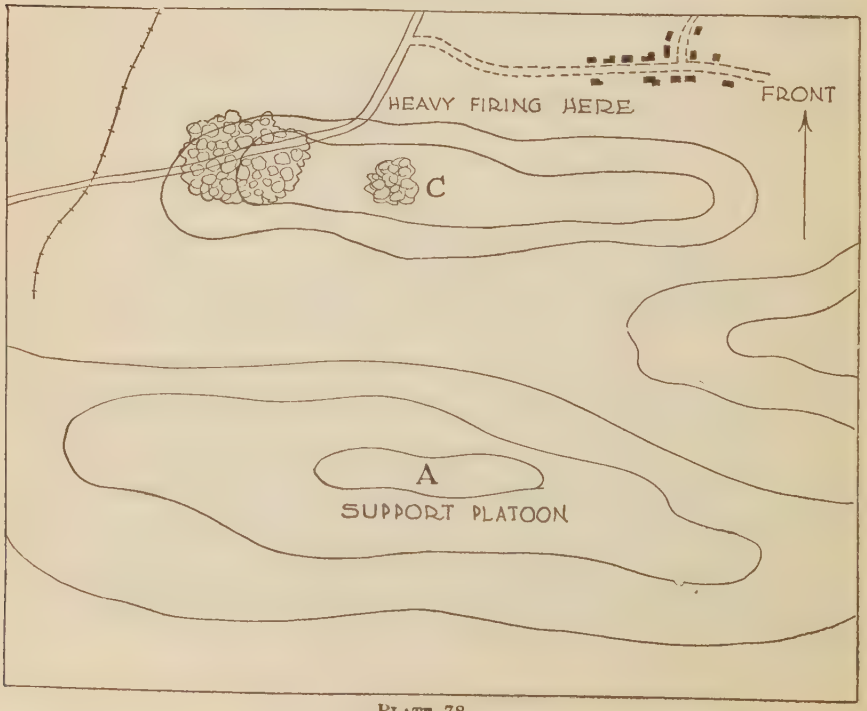


PLATE 78

Situation: In a general advance you reach the point A. The assault echelon is several hundred yards ahead. Company headquarters is at C. You hear heavy firing to the front. You see company headquarters take cover. You are leader of the support platoon.

Requirement: Your actions and orders. (Pl. 78.)

(5) *To assist adjacent units which are held up.*—(*a*) During combat irregularities in the resistance often allow one company to push ahead while an adjacent company is being held up. In this case the company commander may stop the forward movement of his assault echelon and engage in flank the resistance which is delaying the adjacent company.

(*b*) This assistance is given by the support platoon. The conduct of its attack depends entirely on conditions. (See Sec. I.)

(6) *Furnishing protection during reorganization of the assault echelons.*—(*a*) Following the attack, when the assault echelon has become badly dis-

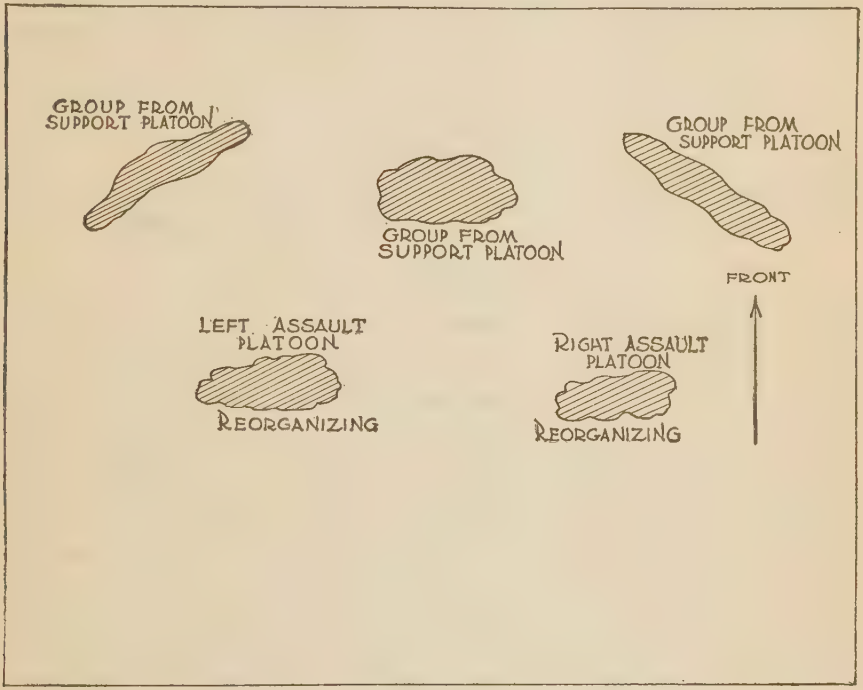


PLATE 79.—Showing a suitable disposition of a support platoon covering reorganization of assault echelon

organized, the company commander frequently sends the support platoon forward to cover the reorganization.

(*b*) In this event, the platoon, preceded by its scouts, moves rapidly ahead as an assault platoon to a position beyond the forward echelon and prepares to resist a counterattack.

(*c*) The counterattack may be expected from a flank rather than from the front. It may be launched at any instant. Rapid reconnaissance and immediate preparation must be made.

(*d*) The platoon deployed in depth is in a better formation to resist quickly an attack from any direction than when deployed on a single line.

(*e*) The following formation, modified to suit the ground, will be found satisfactory in the usual situation.

(7) *To relieve a platoon of the assault echelon.*—(*a*) An assault platoon may be so badly shot up that it will be taken out of the assault echelon and placed in rear as a support. In this case the company commander replaces

this platoon with the original support platoon, which is then conducted in accordance with the principles laid down in Section I.

(*b*) When a support platoon is ordered to replace an assault platoon, it should, if practicable, pass around rather than through the platoon being replaced.

(8) *Mopping up.*—(*a*) The support platoon may be called upon to mop up small areas which the assault echelon passed over quickly. This work is done by a few small groups in accordance with the principles laid down for the squad. (See TR 420-105.)

(*b*) Units on this duty must work rapidly in order that the entire platoon may quickly be made available for further service.

(*c*) If the platoon is to remain at the objective that it mops up, the position is carefully cleaned out and prepared for defense.

17. Support platoon in pursuit.—*a.* After a series of successful local attacks, the enemy may be so badly defeated that he leaves his position, throws

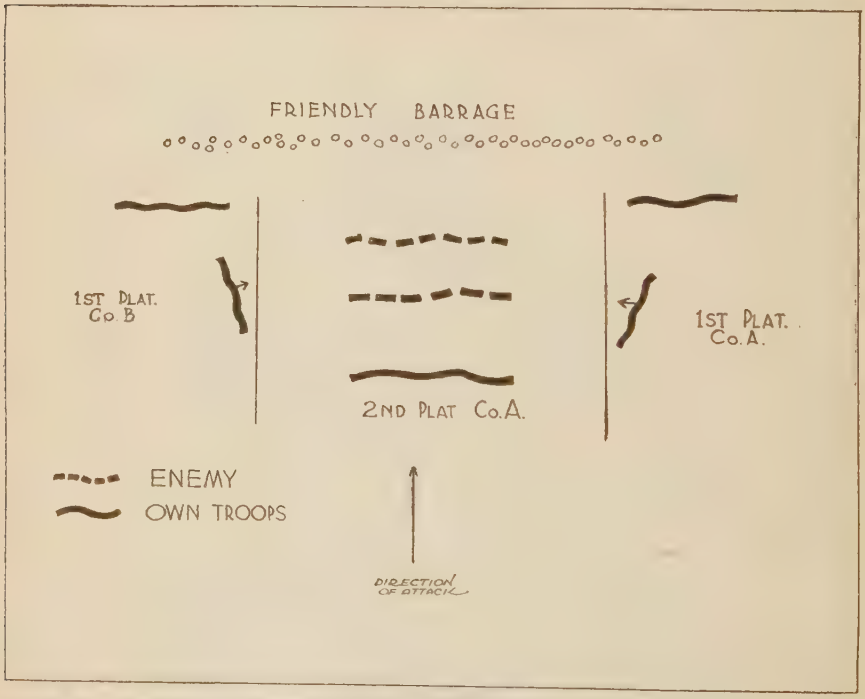


PLATE 80.—Sections of adjacent platoons making flank counterattack in support of a neighboring platoon

down his arms, and retreats in disorder. The attacker seeks, by pressing rapidly on, to keep the enemy from re-forming and offering further resistance. At such time hostile counterattacks are usually weak and a support platoon may safely follow the assault echelon at decreased distance.

b. The function of the support platoon in pursuit is the same as in the attack.

18. Support platoon in defense.—*a. Reference to Section II.*—All that is said in Section II with reference to assault platoons applies also to support platoons.

b. Preparation of positions by support platoons and platoons of reserve companies.—(1) A reserve company is one occupying a position in rear of the line of resistance in a main battle position or in an outpost line.

(2) Support platoons and platoons of reserve companies prepare their positions for defense in accordance with the principles governing preparation by a combat platoon.

(3) When assigned definite combat emplacements, their action is similar to that of combat platoons. Contact is established to the front and flanks. Groups are placed so as to protect the flanks of groups in the firing line ahead and to fire through the intervals between the groups. Sentinels and lookouts are posted and assembly points designated.

(4) Platoons of reserve companies usually have more time than platoons of assault companies for preparation of their positions. The preparation is therefore more complete. The principles governing preparation by platoons of assault companies apply to platoons of reserve companies.

c. Plan of defense.—(1) The plan of defense for a support platoon prescribes—

(*a*) The combat positions in case of alarm;
(*b*) The support to be given; or
(*c*) The counterattack to be launched.

(2) In one case support is provided by keeping the enemy from taking the front line; in another by counterattacking after he has taken it.

(3) Counterattacks directed at the same time against the front, flanks, and rear of an attacking enemy offer the greatest chance for success. The enemy is thus caught and completely surrounded in a defensive system with which he is unfamiliar. The company plan of action for the support platoon will largely determine whether a counterattack can be made in such manner. If the enemy is in force, the platoon counterattacking element, the section, will be too small for other than a movement straight to the front.

(4) The leader of a support platoon acts on his own initiative when communication with company headquarters is broken. If he learns that the first line has been penetrated and he can get no orders from his company commander, he must counterattack upon his own responsibility.

Section IV.—NIGHT OPERATIONS

	Paragraph
Preparation	19
Marches	20
Approach march	21
The attack	22
The assault	23
Consolidation	24
The pursuit	25

19. Preparation.—*a. Reconnaissance.*—(1) In order for a night operation to be successful, reconnaissance during daylight is necessary. If the company is to move at night in a deployed formation, the platoon leader makes a personal reconnaissance. If the scouts are to guide the platoon, they reconnoiter carefully the route to be followed.

(2) This reconnaissance may be simply a visual examination of the part of the ground to be crossed, or it may be a personal visit over part or all of the route to be taken. It should be as complete as time and the enemy permit.

(3) If a night intervenes between the receipt of orders for the attack and the attack, reconnaissance should also be made then. In this way, the appearance of objects seen from the route of advance becomes familiar in darkness.

b. Instructions to troops.—(1) All men must know thoroughly beforehand their parts and the part their units are to play in the movement. In this way confusion is avoided, and all ranks are enabled to enter into the spirit of the operation.

(2) Platoon leaders issue detailed orders far enough ahead of time to enable subordinate leaders to become familiar with the situation and with the plan for the company and platoon. If made known to all men several hours before the movement is to take place, the plan may reach the enemy through spies. When practicable, the necessary information is not given men in ranks until the assembly point for the platoon is reached.

(3) Men are instructed that all commands and verbal orders are to be given in a low voice. Hand and whistle signals are not used.

(4) When flares are thrown in the vicinity of the platoon, the leader requires the platoon to lie down. All men must remain absolutely still until the flare has burned out.

20. Marches.—*a. Preparation.*—Careful and thorough preparation for a night march is made before the march commences. Equipment is prepared to prevent flashing and rattling. Prearranged signals are practiced. When a march is made in the presence of the enemy, magazines of rifles and automatic rifles are filled. Chambers are left empty. The cut-off of the rifle is turned to "On."

b. March discipline.—During marches at night, march discipline is strictly observed. Men keep closed to the proper distances, particularly during halts. Petty officers actively prevent straggling, and during short halts keep men from falling asleep.

c. Rate of march.—The rate of march will usually not exceed 2 miles per hour.

21. Approach march.—*a. Bayonets.*—Bayonets are fixed before the march starts.

b. Formation.—The formation for the approach march at night is usually section columns, one section in rear of the other without distance or at a few yards distance. The platoon leader moves at the head of his platoon. Scouts precede the leader at about the limit of visibility.

c. Direction.—(1) At night direction is easily lost. Loss of direction by one platoon may result in disorganization of the entire command and failure of the attack.

(2) The most reliable method of maintaining direction is by compass bearing. A series of men posted at regular intervals along the route, serves the same purpose. This method can rarely be used beyond the line of outguards.

(3) Special care should be taken that the advance is resumed in the original direction after the passage of an obstacle, such as a sunken or raised road, a stream, a hedge, a fence, or wire. The tendency is to re-form parallel to the obstruction. After passing an obstacle or making a detour, the platoon leader indicates the direction before the platoon resumes its advance.

d. Obstacles.—Houses, small patches of woods, heavy underbrush, and similar obstacles are avoided when a detour can be made without losing direction or leaving the platoon zone of action. Troops should not go over or through an obstacle when it is practicable to go around it.

e. Precautions at final halt.—An approach march at night develops into an attack, or halts with a view to an attack just before daybreak or during daylight. If the attack is to be made just before daybreak or during daylight, the place where the final halt is made should be quietly prepared for defense. Security groups are placed a short distance to the front. Contact with adjacent platoons and with company headquarters is maintained.

22. The attack.—*a. Action when discovered.*—If a hostile outguard or patrol challenges, the scouts answer and rush the enemy with the bayonet. Should it appear to the leader that the enemy force is more than a very small group, he leads the first squad to assist the scouts. The remainder of the platoon kneels or lies down. (See pl. 81.)

b. Advance after alarm has been given.—(1) The advance should be made cautiously until the alarm is given; thereafter speed rather than silence is desirable.

(2) Attacking troops do not fire. Rifle fire at night by attacking troops is always ineffective. It is as dangerous to friendly troops as to the enemy. By revealing the extent of the attack, size of the force, and its location, the effect of the surprise element—the chief advantage of a night attack—is greatly reduced.

(3) Each platoon of the assault echelon, regardless of what happens to adjacent platoons, pushes forward to its objective.

23. The assault.—An assault on a large scale at night is rare. Local groups frequently assault outguards and may be called upon to take positions held by a considerable force. Only the bayonet is used.

24. Consolidation.—As soon as the objective is reached the company commander is informed. Preparations for all-around defense are commenced at once. (See Sec. II.) Security groups are thrown out and contact with adjacent units reestablished.

25. The pursuit.—Pursuit during darkness is never attempted after an attack at night. A successful night attack is best exploited by immediate preparations to resist a counterattack.

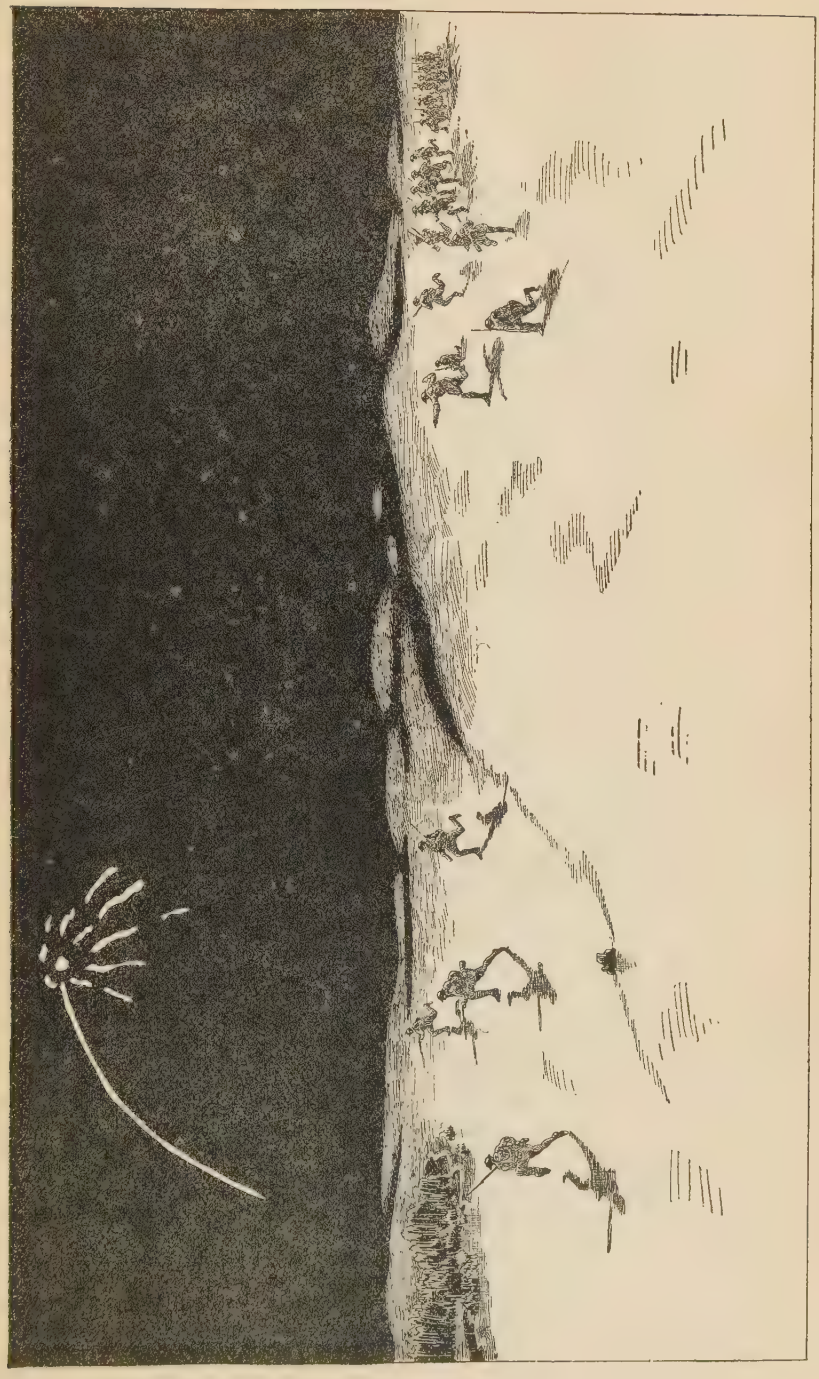


PLATE 81.—Showing action of platoon when challenged during night attack

Section V.—SECURITY ON THE MARCH

Paragraph
Advance guard ---------- 26
Flank protection ---------- 27
Rear guard ---------- 28

26. Advance guard.—(See TR 420-110.) *a. Platoon as advance guard.*—A platoon as advance guard does not have a reserve. It may be divided into support, advance party, and point. Frequently there is only an advance party and a point.

b. Platoon as support.

(1) *Formation.*—When a platoon is a support, it marches in column of twos, one file on each side of the road.

(2) *Advance party.*

(*a*) *Strength.*—The strength of the advance party varies. Usually one section in the support and one in the advance party is a proper distribution. No more than half of the platoon is sent forward as advance party.

(*b*) *Patrolling.*

1. In his orders for the march, the support commander gives definite instructions as to what patrolling, if any, will be done by the advance party. Patrols sent from it will often fall behind and be compelled to join the support. They are then lost, at least temporarily, to the advance party. For this reason, the latter is made strong enough to take care of any flank patrolling with which it is charged.
2. In broken country an advance party of one section can take care of patrolling only up to 200 or 300 yards. For necessary patrolling beyond this distance the support usually must be called upon. In open country where the ground is flat up to 1,000 yards or more, less patrolling is necessary, and therefore a smaller advance party can give proper protection.
3. Whether patrols which are sent from the advance party and have joined the support should be returned promptly to their command depends on circumstances. It is usually advisable to require them to rejoin at the first halt following their return to the column.

(*c*) *Distance from support to advance party.*

1. The distance from support to advance party should be such as to prevent the enemy from delivering effective small-arms fire on the support before the latter can prepare for action. This distance varies with such features as the terrain, nearness of the enemy, and his estimated strength. It is seldom less than 100 and not more than 600 yards. At night and in close country distances are less than in the daytime and in open country.
2. The support should follow the advance party rather than have the advance party precede it. It is difficult for the advance party to keep the distance. It is impossible if the enemy is active. Regulation of the rate of march is a simple matter. If the advance party moves too slowly or too rapidly, the support commander directs the commander of the unit ahead to increase or decrease the rate.
3. The support commander in his order prescribes the approximate distance at which the support shall follow the advance party.

(3) *Position of support commander.*

(*a*) The support commander marches where he can quickly see and estimate the situation when the advance party is fired on. This position is usually between the support and advance party, sometimes with the latter.

(*b*) In the absence of the support commander the platoon chief petty officer or section leader takes charge of the support.

(*c*) The support commander must constantly study the ground, so that he can quickly take up a position if it becomes necessary to fight.

(4) *Action of support when fire is opened to front.*

(*a*) When fire is opened to the front, the support continues the march unless forced by fire of the enemy to halt. The platoon leader quickly estimates the situation.

(*b*) He allows the support to continue its advance, signals it to halt, and sends a runner back with directions.

(*c*) If the advance party is unable to force aside the enemy quickly, the support is brought to its assistance and a determined attack made on the resistance.

(*d*) When the enemy has been driven off, the advance-guard formation is quickly taken up and the march resumed.

(5) *Connecting files.*

(*a*) The function of connecting files is discussed in TR 420–105. Connecting files are invariably sent forward from the support; never back from the advance party.

(*b*) The support commander is thus, even in the closest country, enabled always to know approximately the distance from support to advance party, and can vary this distance at will.

c. Platoon as advance party.

(1) The support commander sends forward from the support a group called the advance party.

(2) The platoon as advance party conforms to the principles given in TR 420–110.

(3) (*a*) The platoon as advance party usually sends forward a point of one squad, but it may send out a point of two squads, one of which precedes the other from 100 to 400 yards. The rear squad of the point precedes the advance party from 100 to 500 yards.

(*b*) This double point affords reconnaissance well to the front. In open country it provides for the advance party considerable protection against automatic small-arms fire at effective ranges.

(*c*) The strength of a double point enables it to locate and drive off promptly small patrols which one squad alone would be unable to handle.

27. Flank protection.—The principles governing the conduct of a platoon in flank protection are the same as for a section. (See TR 420–110.)

Situation: Your platoon, marching from B to A as a flank guard of a column which is marching along the road D–E, was attacked at C and delayed for 35 minutes. At the end of this time you decided that the troops you were protecting had passed on and that you would disengage your platoon and join the column.

Requirement: What are your orders? (Pl. 82.)

28. Rear guard.—(See TR 420–110.) *a. Platoon as rear guard.*—A platoon as rear guard never has a reserve. It may be divided into support, rear party, and rear point. Frequently it will be only a rear party and rear point.

PROBLEM No. 8

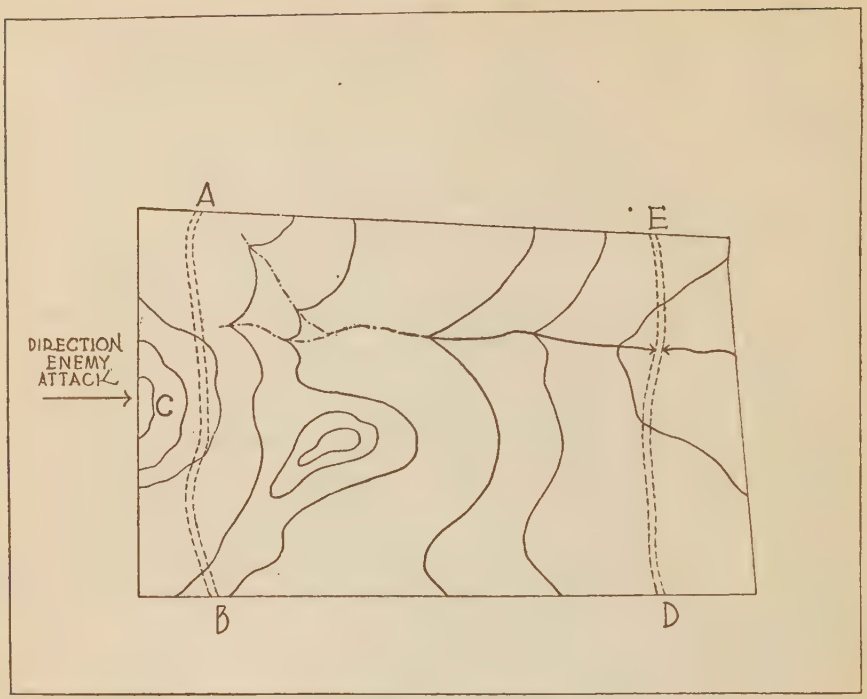


PLATE 82

b. Platoon as support.

(1) *Formation.*—When a platoon alone is the support, it marches in column of twos, one file on each side of the road.

(2) *Connection with unit from which detailed.*—The support is directed to follow at a certain distance the unit from which it is sent. The support furnishes connecting files.

(3) *Rear party.*—It sends to the rear a rear party. (See TR 420–110.)

(*a*) The strength of the rear party varies. Usually one section in the support and one in the rear party is a proper distribution. No more than half of the platoon is sent back as rear party.

(*b*) *Patrolling.*—In his orders for the march the support commander gives definite instructions as to what patrolling, if any, is to be done by the rear party. The support usually furnishes all patrols for distances greater than 200 yards.

(*c*) *Distance from support to rear party.*

1. The distance from support to rear party is such as to prevent the enemy from attacking the support with small-arms fire before it has had time to prepare for action.
2. The rear party follows the support. The commander of the support determines the distance and orders the rear party to follow at this distance.
3. The distance varies with the terrain, enemy, visibility, etc. It should seldom be less than 100 nor more than 600 yards. At night and in close country, distances are less than in open country during the day.

(*d*) *Connecting files.*—Connecting files to the support are furnished by the rear party.

(4) *Position of support commander.*—The support commander marches in rear of the support. If the enemy appears, the support commander is then in a position to determine quickly whether to stop and fight or to continue the march. He must constantly study the ground so that he can quickly take up a position if it becomes necessary to fight.

(5) *Action of support when rear party becomes engaged.*—When the rear party goes into action the support commander must at once estimate the situation and decide whether to take up a position or push on. If it appears that the rear party alone can handle the situation, the support continues the march, detailing a new rear party when it becomes necessary. If he decides to resist, he selects a position well in rear of that held by the rear party.

(6) *Position to be taken by support.*

(*a*) A suitable position provides cover for riflemen, affords a long field of fire, and is convenient for a withdrawal.

(*b*) The enemy is fired on as soon as he appears. When he arrives within 400 or 500 yards, the support withdraws and pushes rapidly on to another position well in rear.

(*c*) A successful rear guard action is one where the enemy is forced to deploy and fight at long range and the rear guard resumes its march with but few casualties before it becomes heavily engaged.

(*d*) This withdrawal under fire is extremely difficult. Automatic rifles and machine guns are used to hold the enemy off while the support is reforming. If the enemy is aggressive it may be necessary to leave behind and sacrifice men with automatic weapons in order to delay him sufficiently.

(*e*) The platoon commander notifies the rear party commander of this decision to fall back and indicates on which flank the rear party is to fall back.

(*f*) He sends a message to the commander of the unit that detailed the support, informing him of the situation and the plan of action.

c. Platoon as rear party.

(1) The platoon as rear party conforms in general to the principles given in TR 420–110.

(2) The platoon as rear party usually sends back a point of one squad, but may send back a point of two squads, one of which follows the other from 100 to 300 yards. This double point affords greater protection for the rear party.

Section VI.—SECURITY AT REST

	Paragraph
Platoon as support of an outpost	29
March outpost	30
Platoon as a picket	31
Platoon as a detached post	32

29. Platoon as support of an outpost.—(See TR 420–110.) The platoon will practically never be the reserve of an outpost. It may be a support.

a. Numbering supports.—Supports are numbered from right to left. The platoon leader is given in orders the number of his support, its approximate location, and the sector it is to defend.

b. Action of platoon leader when he receives his orders.—(1) He assembles the platoon, chief petty officer and section leaders, and issues his preliminary orders. He points out to them the direction in which the enemy is or is thought to be; tells them what the subdivisions of the outpost are in so far as he knows them; where the reserve is to be posted, if there is one; approximate location of the platoon; and where the main resistance will be made.

(2) He then marches his unit to its post. While in rear of the march outpost a half squad as point is sufficient protection. Beyond the march outpost more protection is needed. When the position is reached, he makes a hasty personal reconnaissance. He selects posts for his outguards on or near probable avenues of approach.

(3) He then assembles the leaders, or the entire platoon less any protecting groups he may have out, and issues the remainder of his orders. He points out the location of the support; details the necessary outguards to protect it from surprise; designates a commander for each; tells him where the post of the outguard is to be and the route by which it is to be reached; states what the outguards will do if attacked; states what preparation for defense is to be made by them and by the support; prescribes dispositions of any machine guns which may be attached and their sector of fire; indicates how the messing will be handled; and where messages are to be sent or where he can be found.

(4) He then directs outguard commanders to march to their posts.

(5) He requires the platoon chief petty officer to detail men for any visiting patrols he may wish to send out, a group to furnish sentinels for duty at the support, reliefs for preparation of the position, and all routine details, such as kitchen police and ration or carrying parties.

(6) He inspects the outguards and makes any change in their positions he sees fit. He makes a sketch showing the location of the support and outguards and sends it to the outpost commander.

(7) He instructs visiting patrols in sufficient time to permit them to go over their routes in daylight.

(8) He orders any special patrolling to the front he may wish carried out.

(9) He inspects outguards frequently during the night to insure that they keep on the alert.

c. Outguards.—(1) *Strength of outguards.*—The strength of the outguards sent from a support depends to a large extent upon the terrain and the enemy. Outguards should be reduced to a minimum. The safest and most economical system of protection is by means of outguards at observation points with patrolling between.

(2) *Preparation for defense.*—The main resistance will rarely be on the outguard area. Outguards are usually instructed to resist until the enemy forces them back, when they withdraw to the line of main resistance along a route indicated by the support commander. Outguards dig fox holes for individual protection or use such natural cover for firing as is available.

(3) *Picket from the support.*—(*a*) For covering a main road or the junction of two or more important roads, a *picket* may be used. (See TR 420–110.) The picket then sends out groups to cover the road or roads farther to the front and offers greater resistance to an attack than the smaller outguards.

(*b*) The strength of the picket depends upon the number and importance of the approaches to be covered and the nearness and expected action of the enemy. No rule can be given. Each situation will be different.

(4) *Number of men for outguard duty.*—The total number of men in the outguards should never exceed the remainder of the support.

(5) *Distances from support to outguards.*—(*a*) The distance from the support to its outguards will vary. They must be far enough from the post of the support to be able to give prompt warning of the enemy's approach and enable the support to prepare for action. The outguards must be close enough to the support to prevent the enemy in force from avoiding them and surprising the support.

(*b*) Cossack posts and sentry squads seldom need to go farther than 400 yards from the post of the support. Pickets often have to go farther.

(*c*) Since at night outguards furnish protection by listening, their posts are usually different from the day posts. In general, outguards are moved closer to the support at night and stationed only on roads and paths.

(6) *Numbering outguards.*—Outguards of the same support are numbered from right to left, as shown in TR 420–105.

d. Patroling.—(1) Communication with adjacent supports and between outguards is maintained by means of visiting patrols. The support commander has prominent points or prominent routes beyond the line of outguards reconnoitered by patrols during the day.

(2) Reconnaissance beyond the line of outguards at night is limited to roads and paths.

e. Conduct of men at post of support.—(1) When not on duty requiring arms, men at the post of the support are permitted to stack arms and fall out.

(2) Fires at the post of the support are never allowed.

(3) Smoking may be permitted.

30. March outpost.—*a.* On halts, the platoon as advance, flank, or rear party conforms in general to the principles laid down for the section in TR 420–110.

b. The platoon as support takes position where it can move quickly to the assistance of groups covering the avenues of approach.

c. The support commander inspects hastily the dispositions made by the advance party commander and orders any changes he sees fit. On halting for the night, he reconnoiters the ground thoroughly in order to be able to assist the commander of the outpost by informing him of local conditions when the march outpost is relieved. This reconnaissance must be brief. In a small command the outpost troops for the night normally make the relief within 15 to 30 minutes after camp is reached.

d. In case of an attack by the enemy while the relief is going on, the commander of the march outpost, regardless of rank, takes command.

31. Platoon as a picket.—*a.* When on duty as a picket the platoon conforms, in general, to the principles governing the section as a picket. (See TR 420–110.)

PROBLEM No. 9

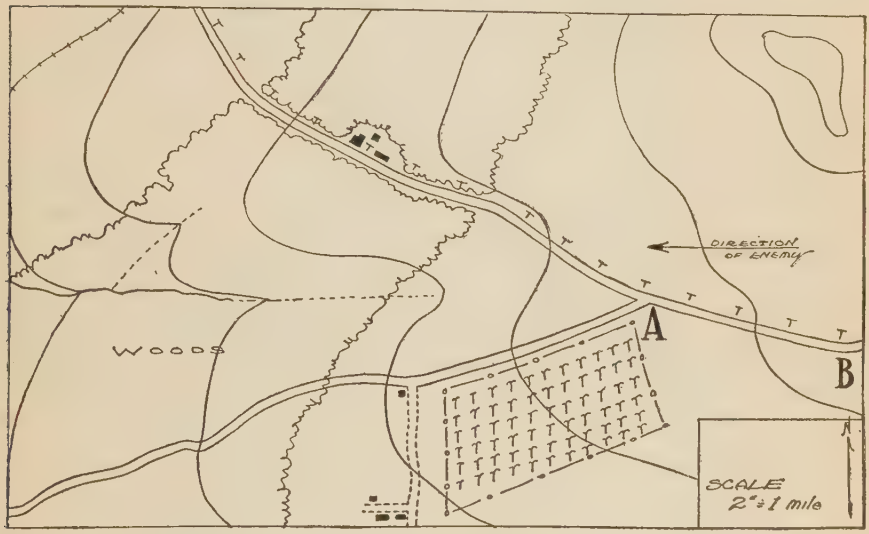


PLATE 83

b. The number of protecting groups furnished by the platoon may, however, be greater than the number furnished by the section. Distances to them may be greater.

c. Patrolling to the front and flanks is made as if the platoon were a support.

d. Outguards are connected by visiting patrols.

e. The platoon leader makes a sketch of his dispositions and sends it to the support commander.

32. Platoon as a detached post.—*a.* The platoon may be called upon for duty as a detached post. It conforms to the principles laid down for the section. (See TR 420–110.)

b. The same kind of patrolling between outguards is carried on as between outguards of a support.

Situation: Your platoon was sent as a detached post to take position in the vicinity of the road forks at A. The main body is to the north of A. You were directed to move back along the road A–B, if forced to withdraw. The nearest friendly support is 1½ miles due north.

Requirement: What are your dispositions? (Pl. 83.)

Section VII.—CONVOY ESCORT

	Paragraph
Description	33
Method of protecting the convoy	34
Officer in charge of the escort	35
Action when capture of convoy seems certain	36

33. Description.—*a.* When a number of wagons or trucks is to be sent from one point to another, they are formed into a train. The train is called a *convoy.*

b. At least one man armed with rifle or automatic rifle goes with each wagon or truck. These men constitute what is known as the *train guard.* They stay with the convoy and fight only when compelled to do so for the close protection of the convoy. They are under the direct charge of the convoy commander.

c. If the enemy is so close as to be dangerous, troops are furnished for the protection of the convoy. These troops, under a line officer, are called the *convoy escort.* A platoon may be assigned as convoy escort.

34. Method of protecting the convoy.—*a.* The escort provides continual reconnaissance to the front and flanks, and details a small guard to follow the convoy as rear guard. Wide dispersion of the escort affords little protection.

b. If the enemy is known to be ahead of the convoy, the escort marches near the front of the column. If the enemy is known to be in rear, it marches toward the tail of the column. It is not necessary for the bulk of the escort to march in the immediate vicinity of the convoy. It marches where it can be quickly placed between the enemy and the convoy.

c. The flanks of the convoy are its weakest points.

d. The escort attacks only when necessary to drive the enemy from a position he holds on the route of march of the convoy. If possible, the convoy makes a detour to avoid resistance in the line of march.

e. An escort never pursues.

35. Officer in charge of the escort.—The officer in charge of the escort is in command of and is responsible for the convoy.

36. Action when capture of convoy seems certain.—If it becomes evident that the escort is going to be overpowered, the commander causes the convoy to be destroyed, in order that no part of it may fall into the hands of the enemy.

TRAINING REGULATIONS, NO. 420-120

INFANTRY

Combat Principles—The Rifle Company

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Section I.—GENERAL

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1. Organization.—The rifle company is organized into rifle platoons and a company headquarters. (See Tables of Organization.)

2. Company headquarters.—*a.* In combat the company headquarters is divided into two groups, the command group and the administration and supply group. The command group is with the forward or assault echelon of the company; the administration and supply group comprises the rear echelon of the company.

(1) The command group comprises such personnel as is necessary for the purpose of—

(*a*) Directing and controlling the actions and movements of the company.

(*b*) Maintaining communication within the company and with higher and adjacent units.

(2) The personnel of the command group consists of the following:

(*a*) The company commander who directs and controls the actions of the company.

(*b*) The company chief petty officer who assists the company commander by the performance of any duties which the latter may assign him.

(*c*) The signal personnel of the company who receive and transmit messages by such visual and mechanical means of communication as may be available or practicable.

(*d*) The company buglers who assist in receiving and transmitting messages and in observing.

(*e*) Runners who maintain communication within the company and with higher and adjacent units.

(3) The senior petty officer with the command group is in charge of the functioning of this group under supervision of the company commander and the chief petty officer.

(4) During combat the command group is augmented by runners, sent from each platoon of the company and from units supporting the company, who maintain communication between the company command post and their respective units. Likewise the company sends runners to the battalion command post to maintain communication between the battalion and the company.

b. (1) The administration and supply group comprises such personnel as is necessary for the purpose of—

(*a*) Securing, preparing, and distributing rations for the company.

(*b*) Securing and issuing supplies.

(*c*) Carrying on the routine administration matters of the company.

(*d*) Providing a nucleus around which the company can be reorganized in case it becomes so depleted that it can no longer continue to operate in combat.

(2) The personnel of the administration and supply group consists of—

(*a*) The second in command of the company who commands the rear echelon of the company.

(*b*) The commissary steward who is in charge of the receipt, preparation, and distribution of rations.

(*c*) The commissary steward who is in charge of drawing, care, and issue of supplies for the company.

(*d*) The company yeoman who is in charge of the care and preparation of the records of the company.

(*e*) Cooks who prepare the rations under supervision of the commissary steward.

(*f*) Mess cooks who assist the commissary steward in handling and caring for supplies.

(*g*) The barber, cobbler, and tailor who act as kitchen police or perform such duties during combat as the second in command may prescribe.

Section II.—ASSAULT COMPANY IN ATTACK

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3. Advance in route column.—*a.* During the advance of the battalion in route column each company commander constantly observes the ground, so that he will at all times be able to deploy or engage his company in suitable formation when the march column is broken up.

b. The company commander requires his officers and petty officers to maintain march discipline and prevent straggling.

c. At night he requires silence and order to be maintained.

d. The commander of the leading company regulates the rate of march as prescribed by the battalion commander. The commander of an interior company regulates the rate of march so as to retain his proper position in the column.

e. The position of the company commander is ordinarily at the head of his company. He goes, however, wherever his duties require.

f. The company headquarters (less detachments) is usually formed as a squad and marched at the head of the company.

4. Approach march.—*a.* The company commander extends his company in an aproach formation when ordered to do so by the battalion commander, or upon his own initiative in order to avoid undue losses in case of sudden emergency.

b. If the formation has not been prescribed by the battalion commander, the company commander orders a formation suitable to the situation.

c. If the nature of the combat formation of the company can be foreseen, the platoons are disposed in the same order in which they will form for the attack. The advance is then directed so that the platoons will find themselves directly behind the positions on which they will be deployed for combat.

d. Where the nature of the combat formation can not be foreseen, or the enemy situation is obscure, the platoons are so disposed that a change of formation can readily be made to meet any contingency. Deployment in depth either in column or echelon is ordinarily best suited for this purpose. When the company is so deployed care is taken to see that distances are not too short. Excessive distance can be corrected by closing up toward the enemy, whereas if the distances are too short there is danger of unnecessary losses from enemy fire and of the necessity of gaining proper distances by a retrograde movement.

e. Having received his orders from the battalion commander, the company commander usually extends his company by issuing to his platoon leaders verbal orders which prescribe the formation. In case of emergency he extends his company by the use of signals or commands.

f. Upon extension of the company or immediately after an extension that is made rapidly, the company commander designates the base platoon, assigns an azimuth, and designates a distant landscape or terrain feature as the direction point. Ordinarily the battalion commander gives the azimuth in his orders.

g. The company commander is responsible for the security of his company the instant it leaves the main column of the battalion. When the advance is not covered by other troops, a leading company covers its advance with scouts or patrols which deal with any resistance encountered from hostile advanced posts and patrols. The company commander takes such additional measures as are necessary for the rapid cleaning up of hostile points of resistance. He will not permit the advance of the company to be unduly delayed.

h. The company commander protects the flanks of the company by placing the company support where it can cover either flank or stop a counterattack directed against a flank. In case the company has an exposed flank, the company commander protects this flank by means of a combat patrol. Ordinarily this patrol is taken from the support.

i. The approach formation of the company is elastic. Distances and intervals are increased or decreased according to the terrain and the necessity for taking cover from enemy fire. Platoon and section leaders, when necessary, on their own initiative prescribe formations best adapted to the situation.

j. The company commander insures that his base platoon guides on the base company; and in case his company is the base, he assures the correct and accurate progress of his base platoon.

k. Suitable covered routes of advance are so utilized that only indistinct and fleeting targets are presented to enemy artillery.

l. Gassed and shelled areas are normally avoided even if it becomes necessary to deviate temporarily from the assigned direction of advance.

m. When it becomes necessary to cross certain dangerous areas, such as roads, crests, or embankments, it may be advisable to do so by a rush of the entire company in order to obtain the effect of surprise and to present only a fleeting target to the enemy or, if the locality should be actually under fire, by successive rushes of small groups which reform on a designated line.

n. When the approach march is made at night, distances and intervals between units are decreased. At times it may require actual physical contact between files. The company commander regulates the rate of march so as to insure control. Luminous compasses should be provided.

o. When the approach march is made through woods, distances and intervals between units are decreased until adjoining units are visible. If the woods are too dense for such disposition, connecting files are used between units. The front of the company is covered by scouts who precede the leading sections at such distance as to remain generally in sight. The company commander regulates the rate of march so as to insure control. Special care is taken to protect the flanks. Connecting groups on the flanks can be assigned the additional mission of flank protection. The direction of march is controlled by the compass.

p. After the extension of the company from column of route, the company commander maintains connection with adjacent units throughout all stages of the advance and combat. This connection is maintained by placing connecting groups of four to eight men each on the flanks of the company. These groups are usually detailed from the support. They march approximately abreast of the support. Loss of contact with adjacent units will be reported at once.

q. A company commander maintains communication with his platoon leaders, battalion commander, and adjacent units during all stages of the advance and combat.

r. The company commander conducts constant personal reconnaissance during all stages of the advance and combat.

s. During the approach march the company commander is with or in advance of his leading units. He moves to points from which he can secure the best possible observation, and thus anticipate the course of action. He should, however, not lose control of his company. When danger of serious losses arises, the company commander should be with his company.

t. The approach march is pushed as far as possible by the company commander. Assault echelons are deployed in skirmish line only when it becomes necessary to reply to the enemy fire in order to advance or to avoid undue losses.

5. Deployment for attack.—*a.* The company commander issues his orders for deployment for attack when he has received his orders from the battalion commander, except in sudden emergencies where it is necessary to return the fire of the enemy at once.

b. The company commander engages his company by issuing verbal orders to his platoon leaders and sometimes to the command group of the company headquarters and the section leaders.

c. Under favorable circumstances, a complete attack order prescribing the duties of each unit is issued to the assembled platoon and section leaders, at a point from which enemy positions can be pointed out. However, it must not be assumed that it will be practicable in every situation to formulate a complete attack order. More often it will be fragmentary in form and may consist of partial orders issued as the situation develops.

d. The orders of the company commander cover the following points:

(1) All information of the enemy not already known by his platoon leaders. Special reference to recent information obtained by reconnaissance from higher authorities. All available information regarding supporting troops, adjacent units, and our own artillery.

(2) A brief outline of his plan of action, the zone of action of the company, the line of departure if one is necessary, an azimuth and, when practicable, a distant landscape or terrain feature as a direction point.

(3) The formation of the company, the assignment of the combat mission for each platoon, and the designation of its zone of action.

(4) The location of the battalion munitions distributing point and the battalion aid station.

(5) The location of the battalion command post and the company command post.

e. The company may be deployed with one or two platoons in the assault echelon and with one or two platoons in support, depending on the frontage assigned to the company and the information available as to enemy dispositions. In exceptional cases all three platoons may be placed in the assault echelon.

f. Ordinarily a platoon is made responsible for a front from 125 to 250 yards. It does not necessarily cover this frontage with a continuous line, but operates in squad or section groups and covers the unoccupied frontage with fire, observation, and patrols. The unoccupied interval allows space for maneuvering.

g. Prior to the fire fight the company commander is usually with or in advance of his assault platoons.

6. The attack.—*a.* The formation in small columns is generally maintained by the assault platoons until they are compelled to reply to the enemy's fire in order to advance. The company then assumes a combat formation.

b. Ordinarily fire is opened on orders of the platoon leaders. Company commanders may, however, reserve to themselves the authority for opening fire.

c. Each platoon advances as rapidly as the circumstances of the fight in its front and flanks permit.

d. Once the fire fight has commenced, the advance of the assault echelon is mainly in the hands of the leaders of the assault platoons, sections, and squads.

e. During the fire fight the principal duties of the company commander are—

(1) To reinforce his assault platoons when they become depleted and to forward ammunition to them when necessary. Reinforcements going forward are utilized for the purpose of carrying ammunition forward.

(2) To maneuver his support echelon so as to outflank or envelop any resistance holding up the assault echelon.

(3) To make necessary dispositions to protect the flanks of the assault echelon against counterattack.

(4) To execute a passage of lines with his support echelon when one of his assault platoons becomes depleted or exhausted.

(5) To prevent the support echelon from merging itself into the first line, and when it is not advancing to keep it under the best available cover within supporting distance of the assault echelon. During progression, to cause the support echelon to follow at supporting distance. It usually follows from 100 to 400 yards in rear of the assault echelon.

(6) To keep the battalion commander constantly informed of the situation.

(7) To carry out the necessary personal reconnaissance and observation so that he is constantly informed of everything taking place to his front and flanks.

(8) To call promptly upon the battalion commander for the assistance of artillery, 37-mm. gun, 3-inch trench mortar, and machine-gun fire when unable to reduce hostile resistance with the means at hand, giving in such cases a definite target to the supporting or Infantry weapons.

(9) When a machine-gun unit is supporting his company, to request machine-gun fire from that unit whenever needed.

(10) To maintain the morale of the company by personal example.

(11) To interfere with the platoon commanders only when it is apparent that they are not functioning properly. Great care should be exercised in this respect not to destroy their initiative.

(12) To reorganize the company whenever opportunity presents itself.

(13) To insure mutual support of assault platoons and to lend support to adjacent companies.

(14) To see that prisoners are sent to the battalion command post.

(15) To see that no effectives are allowed to go to the rear with wounded men.

f. The position of the company commander is where he can best carry out the missions outlined in paragraph 6*e*. Usually he is with the support or between the support and the assault echelon. He must at all times be at a point from which he can observe the action of the assault echelon. When the supports have been entirely absorbed in the assault echelon, he joins that part of the line from which he can best control the advance of his company.

g. The distance of the support echelon from the assault echelon is dependent on the situation and the terrain. It must at all times be close enough to effect timely reinforcement. In general, it follows the assault echelon as closely as cover and the possibility of movement toward a flank will permit.

h. Reinforcements are placed on the flanks of the assault echelon or in a gap in the line. If such action is impracticable, they are sent forward, widely deployed, with instructions to individuals to join the squads into which they merge upon arrival at the assault line. Each man then obeys the orders of the nearest squad and platoon leader.

i. Reinforcements join the assault echelon as quickly as possible without exhausting the men. Their movement may be similar to that of a group executing a rush, or they may be sent forward by infiltration.

j. The original platoon division of the company should be maintained and not broken up by the mingling of reinforcements.

k. Upon joining the assault echelon officers and petty officers accompanying a reenforcement take over the duties of others of like grade who have been disabled or distribute themselves so as best to exercise their normal functions. Conditions will vary and no rules can be prescribed. It is essential that all assist in mastering the increasing difficulties of control.

The reenforcement of the assault echelon by driblets of a squad or a few men has no appreciable effect. The assault echelon requires either no reenforcement or a strong one. Generally a section or a platoon is sent forward under cover of heavy fire by the assault echelon. Care must be exercised when attempting to build up strength in front when there exists a preponderance of enemy strength.

7. The assault.—*a.* When the assault echelon has progressed within assaulting distance and fire superiority has been gained, the assault is launched for the purpose of closing with the enemy.

b. The company commander is responsible that the assault is delivered at the proper moment.

(1) When the distance to be covered is short and the assault has not been started by the assault echelon, the company commander gives the signal or command for the assault. This signal or command is repeated by all officers and petty officers. The skirmishers spring forward at a run with bayonets at charge and close with the enemy. In a charge of this nature it is not desirable to cover more than 50 yards distance.

(2) When the distance to be covered is more than charging distance, the procedure is the same as outlined above, except the men move forward at a walk, using assault fire until charging distance is reached, when they charge the hostile position.

(3) When the advance is held up in front of local hostile resistance, all available fire power is brought to bear upon the enemy position in order to gain fire superiority. The company commander then rapidly organizes his company for the assault. If the artillery, machine guns, 37-mm. guns, and 3-inch trench mortars, or any of these arms, are firing upon the hostile position, the assault echelons are pushed as far forward under the cover of their fire as is consistent with safety. The fire of these supporting or infantry weapons is lifted at a prearranged signal or hour. The assault is launched as outlined above, the moment the supporting fire is lifted.

8. **Reorganization.**—*a.* After a successful assault, the company pursues the retreating enemy with fire and the company commander reorganizes his command on the captured ground in order to hold it or continue the attack in an orderly manner.

b. The principal duties of the company commander in reorganization are—

(1) To appoint platoon leaders where necessary.

(2) To direct the platoon leaders to reorganize their platoons.

(3) To request the battalion commander to send forward sufficient ammunition to replenish his ammunition supply.

(4) To see that ammunition is gathered from the dead and wounded.

(5) To see that the leading platoons push out small groups to the front to cover the reorganization.

(6) To notify the battalion commander of the situation and the approximate strength of the company.

(7) If supported by machine guns, to confer with their commander regarding positions to be occupied by the guns.

(8) To reorganize his company headquarters, replacing casualties with men from the platoons.

(9) In general, to supervise the reorganization of all the units within the company.

9. **Pursuit.**—*a.* When the company reaches its objectives, the retreating enemy is pursued by fire as long as he is within range. The company commander sends out the necessary patrols to maintain contact with the retreating enemy and to provide security. He then accomplishes the reorganization as outlined in paragraph 8.

b. The company does not take up the direct pursuit without orders from the battalion commander.

c. When the company has been ordered to pursue, it moves forward in deployed or approach formation unless otherwise directed.

10. **Organization of ground.**—*a.* When the advance is definitely stopped, the company commander establishes his firing line and support line as directed by the battalion commander and organizes his area. In the absence of directions he acts upon his own initiative.

b. The principal duties of a company commander during the organization of the ground are—

(1) To send out covering detachments sufficiently far to the front to cover the organization of the firing line.

(2) To decide upon the arrangement of the platoons in the area.

(3) To locate the firing line and support line accurately.

(4) To assign the areas to be organized by combat groups.

(5) To locate the company command post.

(6) To establish contact with adjacent units and the rear.

(7) To assign sectors of fire to the different units of the company and arrange for their mutual support by flanking fire.

(8) To confer with the machine-gun commander in support as to the location of the machine guns and what machine-gun support is to be given.

(9) To make a report of his dispositions to the battalion commander, preferably by a simple sketch of the position showing the dispositions.

c. Under ordinary circumstances, the organization of the ground by an assault company is very difficult. The assault troops are usually badly disorganized and scattered. During the day it may be necessary for the company to dig in just where it finds itself and wait for darkness to complete the organization of the ground.

Section III.—RESERVE COMPANY IN ATTACK

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11. Reserve company.—When the battalion commander extends his battalion in an approach or attack formation he usually assigns one or two rifle companies as the battalion reserve.

12. Missions of the reserve company.—In an attack the battalion reserve is disposed in such a manner that it may quickly be brought into action when assigned any of the following missions:

a. To envelop points of resistance developed by the assault echelon.
b. To cover the flanks of the assault companies.
c. To repel counterattacks, especially against the flanks.
d. To assist the advance of the assault echelon.
e. To assist the progress of adjacent units.
f. To take over the rôle of all, or a part of the assault echelon.
g. To furnish details and carrying parties for the assault companies.
h. To provide connection between adjacent units.

13. Formations.—The formations of a reserve company are governed by the same principles as those of an assault company.

14. Movements.—*a.* The company commander moves his company forward by bounds from one position to another or from cover to cover, as directed by the battalion commander or in accordance with the general instructions of the battalion commander.

b. The company commander selects and reconnoiters his forward route and his next position before the company is moved forward. Usually the battalion commander will select the new general location and order the move, but the company commander does not await instructions in this respect. When the situation demands a move, he so reports to the battalion commander and requests instructions.

c. A reserve company must always be within supporting distance of the assault echelon.

15. Reconnaissance.—*a.* In order to be able to carry out the different missions outlined in paragraph 12, the company commander must keep himself constantly informed of the situation.

b. He keeps himself informed—

(1) By personal reconnaissance and observation from advantageous points of the terrain.

(2) By observation stations manned by the buglers of the company.

(3) By reconnoitering patrols accompanying the assault companies.

(4) By having his company chief petty officer remain at the battalion command post while his company is in reserve. The company chief petty officer keeps him informed of every matter of importance that comes through the message center.

(5) By runners who are with the battalion commander.

c. A reserve company commander often precedes his company and takes station where observation is favorable. Frequently he accompanies the battalion commander or is within easy communication with him.

16. Flank protection.—*a.* The reserve company covers the flanks of the assault units when necessary. The company commander has the flanks of the assault companies constantly in mind. When the situation requires, he disposes elements of his company in such a manner that he can cover a threatened flank by fire from a position in rear. In making dispositions for this purpose he does not allow his units to pass beyond his control.

b. A reserve company is never employed, except in an emergency, without the orders of the battalion commander.

Section IV.—COMPANY ACTING ALONE IN ATTACK

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Company acting alone in attack 17

17. Company acting alone in attack.—*a.* In general, the company, when acting alone, is employed according to the principles applicable to the battalion acting alone. The company commander employs platoons as the battalion commander employs companies, making due allowance for the differences in strength.

b. The company must be well protected against surprise.

c. Combat patrols on the flanks are especially important.

d. Each leader of a flank platoon details a man to watch for signals of the patrol or patrols on his flank.

Section V.—COMBAT COMPANY IN DEFENSE

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18. Mission.—The company is usually part of a larger unit and as such is assigned a position on the firing line with a certain area or a reserve position to defend. The company, according to its mission, is either a combat or a reserve company.

19. Disposition of a combat company for defense.—A combat company in the first line is usually deployed in three lines, as follows:

a. Local security or line of observation.

b. Firing line.

c. Support line.

20. Observation and security.—*a.* A combat company generally provides for its own security. One platoon may furnish the entire security detachment for the company, or each first-line platoon may provide for its own protection. Unity of command makes it desirable to have one platoon, usually from the support, furnish all the outguards. When the frontage assigned to the company is considerable, when good approach trenches connect the line of observation with the firing line and when the distance between the two is short, it may be more desirable to have each front-line platoon provide for its own protection.

b. The strength of the outpost detachment or detachments is kept at the minimum necessary for the proper security of the firing line. In open country and in daylight they need not be as strong as in close country and at night. Under certain special conditions of the terrain they may be dispensed with, particularly in daylight, and their duties performed by the firing line.

21. Firing line.—*a.* The firing line is the main line of the defensive position of the company. This line may be held by one or two platoons according to the extent of front assigned the company and the general character of the defense. The actual strength of the firing line depends more upon the manner in which it is occupied than upon the number of troops occupying it.

In general, the firing line is occupied by combat groups. These are ordinarily organized for all-around defense and located so as—

(1) To afford, by delivery of flanking fire, mutual fire support to adjacent units of the firing line.

(2) To permit concealment during the advance of the enemy, at the same time allowing the delivery of effective fire.

(3) To cover, by frontal or flanking fire, all intervals between adjacent combat groups, as well as to the front covering all approaches.

b. The automatic rifle is a most valuable weapon for the delivery of a powerful flanking fire in front of the obstacles protecting the front line. Machine guns are assigned similar missions by the battalion commanders. The positions chosen for the purpose of using flanking fire are best constructed so as to be protected from hostile frontal fire. The arrangements for flanking fire are such that fire can be delivered by day or night, in fog, smoke, or the dust of battle. In making arrangements for occupation of the firing line, careful consideration is given to the use of automatic rifles and machine guns in flanking fire. The firing line contains only splinter-proof shelter, because deep dugouts become traps for their occupants.

22. Support line.—The support line is the line along which the support platoons of the combat companies are located. A combat company may have one or two platoons in support. The support line is located so as to offer resistance to the front and flanks, and, if located on the forward slope, to cover by fire the flanks and the unoccupied interval between the elements of the firing line. The support line is located on the reverse slope when the principal mission of the support is to counterattack, or where the nature of the terrain does not afford a suitable position for the development of the fire power of the support. It contains cover and concealment for the support.

23. **Combat group.**—*a.* A combat group is generally composed of a section or platoon. It always contains automatic rifles, rifles, grenades, and sometimes machine guns. It may be distributed along a single trench either parallel or perpendicular to the front, in which case its exposed flank or flanks should be protected by fire from adjacent combat groups. It may be located so as to include portions of trenches running both perpendicular and parallel to the front, in which case it will be prepared for all-around defense. In the offensive, combat groups may be temporarily employed for flank protection.

b. A combat group includes a number of positions for automatic guns arranged so as to bring flanking fire along the front, flanks, or rear of adjacent combat groups. A combat group also includes positions for automatic guns prepared for firing to the front, covering all approaches. It is essential that each combat group be prepared to assist in the protection of adjacent combat groups by flanking fire from automatic guns.

24. **Strong point.**—*a.* A strong point generally extends over two lines, the firing line and the support line, and may, if its mission is primarily defense to the flank, extend over three lines—the firing line, the support line, and the battalion reserve line. When a strong point is located entirely on the battalion reserve line or the regimental reserve line, it is given depth by the organization of combat groups along approach trenches or special intermediate trenches prepared for that purpose.

b. A strong point is always organized for resistance to the front and flanks. If the terrain permits, it will be capable of defense to the rear. Obstacles should cover the front and flanks of the strong point but should not disclose its location or interfere with the maneuvering of supporting troops in making counterattacks.

c. A company defending a strong point will never abandon it except on orders from a superior commander.

25. **Method of procedure in organization for defense.**—*a.* The company commander reconnoiters the terrain to be occupied, makes his decision, assembles his platoon leaders on the position, and issues his combat orders.

b. The orders of the company commander for the occupation and organization of the strong point include the following:

(1) Information of the enemy and of our supporting troops.
(2) Location of the firing line and support line.
(3) Information as to covering detachments to the front.
(4) Information as to trace of obstacles.
(5) Information as to location and sectors of fire of supporting machine guns, 37-mm. gun, and 3-inch trench mortar.
(6) Information as to the normal barrage covering the front.
(7) Designation of company section of the firing line.
(8) Information as to sections of the firing line of adjacent companies.
(9) Assignment of platoons to firing line.
(10) Assignment of platoons to support line.
(11) Detail of an outguard when necessary.
(12) Directions as to combat emplacements to be constructed.
(13) Direction as to cover trenches for supports.
(14) Detail of working parties for construction of obstacles and for other purposes.
(15) Location of combat train (or munitions distributing point and kitchen).
(16) Information of location of the battalion aid station.
(17) Information as to communication within the company and pyrotechnic code.
(18) Location of the company command post.
(19) Other necessary directions as to conduct of defense.

c. The detail into which the orders go depends upon the situation. Where the company has sufficient time more detail may be gone into. In a hasty occupation, details are not taken up at first, but only the necessary instructions are given to get the company into position and then the detailed instructions are issued from time to time. In no case are instructions so detailed and ironclad as to take the initiative from platoon commanders.

26. **Duties of the company commander.**—The duties of the company commander are—

a. To supervise the construction of fire trenches of the combat platoon.

b. To see that combat emplacements are so sited that platoons can support each other by flanking fire and that the fire power of all weapons of his area are coordinated in accordance with the plan of adjacent units and of the battalion commander in such a manner that no dead spaces exist in the field of fire.

c. To make provisions for the construction of approach trenches. To require that fire trenches be connected with each other, with those fire trenches of adjacent companies, and with the support trenches.

d. To prescribe the construction of such lateral lines of defense as are necessary.

27. Company command post.—*a.* The company commander usually stations himself either with the support platoon or between the combat and support platoons in order to maintain close communication with his platoon commanders and to conduct the combat of the entire company.

b. The command post is located with a view of permitting observation to the front and flanks. Its position is hidden from enemy view, either by natural cover or camouflage.

c. In a stabilized position more detailed precautions are taken, such as preventing the making of paths, which would reveal the location to the enemy through aerial photography.

28. Company observation post.—The observation post of a company should be as near to the company command post as consistent with giving it not only a view of the company's position and a view to the flanks, but also a view of the enemy's position in front of the company. Such measures are taken for the concealment and protection of the observation post as time will permit.

29. Conduct of the company in defense.—*a.* During the early stages of the hostile attack, the outguards, while retiring, screen the firing line by delaying and harrassing the enemy. They cause the enemy to deploy and show his strength. The riflemen of the company open fire at mid range. The enemy's attack, in spite of the delay caused by the harassing action of the outguard and rifle fire from the firing line, can always succeed in reaching assaulting distances either under cover of its own fire, darkness, or smoke. The slowing up of the attack gives the company commander further opportunity to perfect his dispositions in case he has had little time for preparation. The duty of the company commander at this stage of the fight is to keep the battalion commander informed of developments.

b. The outguards withdraw as the attack progresses. The assault echelon continues its fire, and at the same time the Infantry weapons of the defense keep the attacker under fire.

c. To prevent the hostile attack from reaching the firing line, fire superiority must be gained and maintained by the defense. The combat groups mutually support each other by flanking fire. The dead spaces in the bands of machine-gun fire are covered by grenades and by rifle and automatic rifle fire whenever practicable.

d. The company establishes its defensive power by methodical organization of its fire, by its more accurate knowledge of the ranges, and by concealment of its dispositions.

e. Rifle grenades and hand grenades are used against hostile troops which have taken cover and can not be reached by direct fire and in repulsing night attacks.

f. If the enemy succeeds in reaching the position held by the firing line, the riflemen leap to the parapet and meet the enemy with the bayonet.

Section VI.—RESERVE COMPANY IN DEFENSE

Paragraph
Reserve company 30

30. Reserve company.—*a.* The reserve company is assigned to the defense of all or a part of a reserve line—known as the battalion reserve line—in which position the battalion reserves are located. The method of organizing a reserve line of defense is similar to that prescribed for the first line or combat companies. The reserve company is located and disposed so as to check and throw back by counterattack any hostile elements which succeed in penetrating the firing line. The company commander of a reserve company reconnoiters the section of the firing line in his front and maintains contact with the company commanders of the adjacent combat companies. A reserve company is always prepared to support the units on the flanks of the battalion as well as the combat companies of its own battalion by either fire or counterattack.

b. The strong points on a battalion reserve line are located with a view to covering the intervals of the strong points in their front.

c. If a reserve company is held in a position of readiness, measures are taken to insure the prompt assembly of the company in case of a hostile attack.

Section VII.—COMPANY IN A STABILIZED POSITION

Paragraph
Duties of company officers ---------- 31
Company executing a relief ---------- 32

31. Duties of company officers.—*a.* Each officer commanding a unit, large or small, formulates a plan of defense and makes it known to all subordinates concerned with its execution. This plan is based on the plan of the next higher commander, the terrain, and knowledge of the enemy. In making the plan the following points are considered:

(1) The probable points that may be attacked.

(2) The selection of the main point of resistance and the strength required to occupy it.

(3) The preparation for counterattacks.

(4) The provisions for communications, supplies, disposition of casualties, and good observation.

b. The principles involved in the defense in mobile situations are applicable in a stabilized position.

c. In the preparation and maintenance of a strong point in the defense the company commander is responsible for—

(1) Plan of defense; sketch of position; copy of orders for the combat groups; employment of various weapons.

(2) Confidential documents kept in trenches, limited to minimum; arrangement for their destruction prior to the attack.

(3) Good condition of the trenches; selection of officers for inspection and guard.

(4) Inspections to be prescribed; suggestion about patrols to the battalion commander.

(5) Study of the possible perfection of his plans for defense and counterattack, and the material welfare of the men in the trenches.

(6) Selection of an observation post.

(7) Location of the C. P., the telephone, munitions distributing points, water, rations, and supplies.

(8) Study of raids that are possible.

(9) Communication by telephone, visual signaling, or by other means with the battalion commander and adjacent companies.

(10) Personal touch with 3-inch trench mortar, 37-mm. gun, and machine-gun units.

(11) Provisions for calling for a barrage fire.

(12) Daily reports: Observation of hostile artillery fire, origin, hour, caliber, and points of fall.

d. The company commander makes daily inspections of his entire strong point, corrects deficiencies, and assures himself that all leaders are familiar with their duties in the execution of the plan of defense.

32. Company executing a relief.—*a.* When a company is ordered to occupy the trenches at night, a reconnaissance of the ground to be occupied is ordinarily made during the preceding daylight hours by the company commander and the leader of each platoon.

b. The company being relieved furnishes guides for the incoming company; one for each platoon and one for company headquarters. These guides meet the incoming company at the designated entrance to the communication trenches at the time ordered and conduct the units to their respective positions.

c. The platoon leaders assemble at the C. P. of the company commander, study the plan of defense of the company strong point, and receive the explanations of the company commander of the outgoing company. The company commander assigns his platoons to the different combat groups of the strong point. Each platoon leader then proceeds to the command post of the leader of the platoon that is to be relieved by him.

d. The relieving company commander is not required to base his arrangements and orders exactly on those of his predecessor. However, to facilitate the relief, the company commander takes over and disposes his company in the same general manner as the outgoing company and makes no change in the dispositions until after daylight. Before making any material changes in the plan of defense of his strong point, the company commander secures the approval of his battalion commander.

TRAINING REGULATIONS, NO. 420–125

INFANTRY

Combat Principles—The Machine-Gun Section

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Section I.—GENERAL CONSIDERATIONS

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1. **Organization.**—The machine-gun section consists of two machine-gun squads and is commanded by the section petty officer. Each squad consists of a petty officer and 10 men, making a total of 23 men in the section.

2. **Equipment.**—Each squad is provided with one machine gun and the necessary accessories to keep the gun in action. Transportation (in the Infantry) consists of one gun cart and one ammunition cart for each squad. (See Cole cart paragraph 13–29.)

3. **Command.**—When the section is acting as a part of the platoon, the section leader receives orders and instructions from his platoon leader. If the section is acting alone and specifically assigned to another unit, the section leader receives orders and instructions from the commander of that unit. The section leader carries out the desires of his commander by giving appropriate commands and instructions to the squad leaders of the two squads of his section. The squad leaders direct the work of their squads. In case the section leader becomes a casualty, the senior squad leader takes command.

The section leader commands the transportation of his section only when he is specifically ordered to do so. In general, the platoon leader directs the movements of the carts through the transport corporal.

4. **Tactical employment.**—*a.* The section is the usual machine-gun fire unit. Occasionally machine guns are employed together in platoons to perform the same fire mission by direct laying. Only in exceptional cases are machine guns employed singly. Such cases include their employment for flanking fire in the defense. Machine guns are employed in pairs (by section) for the purpose of control, to facilitate supply, and to insure continuity of fire. Because mechanical stoppages or hostile fire may interrupt the functioning of a machine gun, it is generally best to assign to both guns of the section the same mission in order to insure continuity of fire. When both guns are engaging the same target and one, for any reason, is forced to stop firing, the other will, if necessary, increase the rate of fire. When the sector of fire assigned to a section is covered by allotting half to each gun, the gun remaining in action covers the entire sector if the other gun is disabled or forced to cease firing.

b. The guns of a section are kept close enough together in combat to be controlled directly by the section leader and to be able to apply their combined fire power under his direction. However, sufficient distance between guns is maintained to prevent the destruction of both guns by a single shell. This is ordinarily about 20 to 50 yards. Available cover may make it necessary to place the guns farther apart, but preferably this distance should not be so great that the section leader can not control both guns by verbal commands or arm signals. The machine guns are generally located so that they may cover the same field of fire. There will be certain situations where it will be necessary to depart from this principle, but such situations may be considered exceptional.

Section II.—THE MACHINE-GUN SECTION IN ATTACK

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5. General principles of attack.—*a.* Fire superiority must be obtained before the advance to the assault begins. An attack made in the face of superior enemy fire will seldom be successful and will always result in excessive casualties. The best means of reducing the effectiveness of the fire of the enemy is to apply a greater or superior fire against him.

b. The attack is made by using fire and movement. Fire is used to hold the enemy in place and render his fire ineffective. Movement is used to close with the enemy and take from him the ground which he holds.

c. The advance is made by a series of fights for important positions. Each position, when taken, forms the supporting point from which further advance is made.

d. An attack is organized in depth, that is, the attack is not made by assault units alone but by a series of units one behind the other. The troops in rear are used to support the forward units by filling gaps or flanking enemy strong points, and are used against counterattacks from the flanks.

e. Surprise is an essential element of a successful attack. If the time and method of an attack is known, the enemy will prepare to meet it. The moral effect alone of a sudden, unexpected attack is worth striving for.

f. The employment of machine guns is governed by these principles. The tactical handling is based upon a knowledge of the characteristics of the gun itself. Machine guns can produce a great volume of fire which is both flexible and easy to control, and they require very little space in which to operate.

6. Approach march.—*a.* In the approach march, the section marches as a part of the platoon to which it belongs. When the platoon deploys, the section leaders take charge of their sections and conduct them along the route indicated by the platoon commander or to designated positions. After the platoon deploys, section leaders conduct their sections so as to remain under the control of the platoon leader, unless missions or positions are assigned which remove them from the control of the platoon leader.

b. When the platoon is going forward deployed, the section leaders cause their sections to take up a formation best suited to the conditions under which the advance is being made. When under enemy observation, the formation adopted by the machine-gun section should conform to the formation of near-by riflemen.

Column is the most convenient formation. Control is easy and the section is well in hand. The section leader may precede his section (10 to 50 yards) to select the best route.

The section deploys when it expects to come under fire.

(1) A formation with the squads in column with 20 to 100 yards distance has the advantage of requiring only one route to be reconnoitered. The leading squad clears the route when necessary. In a long advance through difficult terrain, squads may alternate in breaking the trail. When the squads follow in trace they are less liable to become separated.

(2) Line of squads at 20 to 100 yards gives the required interval to minimize the effect of shell fire without the depth or elongation resulting from the column. The section leader is about midway between his squads. Both squads are thus under his immediate control. The section should cross short stretches of open country which is under enemy observation and subject to artillery or long-range machine-gun fire at a rapid gait and in line of squads. This formation is better than squads following in trace, because the leading squad will probably draw fire which the rear squad may run into. In woods and broken country, squads in line are liable to become separated in their efforts to find suitable routes.

(3) A formation with echeloned squad columns combines deployment in both breadth and depth. This formation is useful on open ground where only scattered cover exists and for a unit marching on an exposed flank.

7. Reconnaissance.—*a.* Reconnaissance is the term used to designate the work of troops or individuals when gathering information in the field. The information particularly needed to employ machine guns successfully is—

(1) Location of favorable or important targets.
(2) Location and intentions of troops which the guns support.
(3) Location of suitable firing positions.
(4) Suitable routes of approach.
(5) Location and targets of adjacent machine guns and other supporting weapons.

b. This reconnaissance is carried on by the company and platoon headquarters, and the information obtained is transmitted to the section leaders in the form of orders.

8. Occupation of positions.—*a.* Generally the platoon leader precedes his platoon, and the sections are conducted by the platoon chief petty officer to a point close in rear of the first firing positions. Usually this is the point where the guns must be taken from the carts and carried forward by hand.

b. The platoon leader may, at the point where the platoon is halted, assign positions and missions to his sections, or he may send for his section leaders and assign missions at a point farther forward.

If the platoon leader desires the section leaders to leave their sections and join him, he usually sends a runner back to get them. The runner who brings back the instructions will conduct the section leaders to the platoon leader, or indicate his position so they can find him. When the section leaders go forward, the platoon chief petty officer directs the unloading of equipment and sends the squads forward or holds the platoon under cover, in accordance with the orders of the platoon leader.

c. From a point at or near the firing positions, the platoon leader points out to the section leaders the enemy and the position of friendly troops and explains as much of the plan of attack as is necessary for the section leaders to know. He points out the approximate location for the sections and assigns targets or sectors of fire, and gives the ranges to important points if he has determined them.

d. Section leaders then go to their respective positions. Every precaution must be taken to prevent the enemy from observing the squads as they enter their positions. If the guns are seen entering the position, they will draw fire, and the mounting of the guns and the bringing up of ammunition will be difficult. Each section leader selects the positions for the guns of his section to execute the mission assigned. In selecting positions careful consideration must be given to cover and approach.

e. As the squads approach, the section leader signals the squad leaders to join him. He points out the approximate positions for their guns and gives them the necessary fire orders.

f. Each squad leader selects the exact position and directs the mounting of his gun. Utilization of concealment from view is of the greatest importance. Cover from fire is secured at the gun position by taking advantage of such natural cover as is found.

g. The guns of a section are located 20 to 50 yards apart. If good natural cover against fire is available, this distance may be decreased.

h. The carts remain in rear under cover in charge of the transport petty officer.

9. Conduct of fire.—*a. Division of the target.*—The platoon leader may assign a definite target to the section. In this case the section leader engages the target in accordance with the principles laid down in chapter 13. If the situation is such that a definite target can not well be assigned at the time, the platoon leader may assign a sector of fire to the section, in which case the section leader directs the fire of his section on the most important targets which appear in his sector.

b. The mission of the machine guns is to support the attack by fire. The best means of supporting the attack is to fire on those elements of the enemy which are causing losses to our own troops. Such targets are generally the most obscure, and it may be necessary to search out areas where a machine gun or automatic rifle is concealed. When a sector of fire is assigned to a section, the section leader must diligently observe the enemy position with glasses to determine those organized strong points which are offering resistance to our troops.

c. On definite targets, fire is opened suddenly in bursts of 10 to 30 rounds, in order to annihilate them instantly. Small bursts have little effect either morally or physically.

d. With the fleeting targets appearing and disappearing over a large sector, it may be necessary to assign half the sector to each gun in order that all targets may be quickly engaged.

e. The section is the usual machine-gun fire unit, and best results are obtained when both guns are concentrated on the same target. Surprise effect is obtained by having both guns open fire at the signal of the section leader. On large and important targets the platoon leader may require both sections to open fire simultaneously at his signal. When it is desired to fire on signal, guns are loaded and laid on the target. The squads signal **Ready** to their section leaders, who, if the situation requires it, signal **Ready** to the platoon leader. Unless speed in getting the guns into action is the most important consideration it is best not to open fire until both guns are in position. The noise of the firing will attract attention, and the movement of the other gun in getting into position may disclose the location of the section.

10. Supply of ammunition and water.—*a.* Squads take care of their own ammunition and water supply by carrying it forward with them when the equipment is removed from the carts. Ammunition supply is established by members of the squad in accordance with the principles of drill.

b. If the distance to the carts is too great for the squads to function individually, the section leader combines the carriers of both squads into a single system of supply and ammunition is brought up to a point convenient to both squads.

c. Empty boxes are sent back to the carts.

d. Ammunition supply during an advance is exceedingly difficult. Expenditure of ammunition must be very carefully watched. The section leader is responsible that no firing is done which will not bring results commensurate with the ammunition used. There will be a critical point in the combat when success or failure will depend upon fire effect. Ammunition must be at hand so that this fire may be supplied when called for.

11. Communication.—The platoon leader maintains communication with the sections of his platoon by using runners and signals. When practicable, the platoon leader takes a position from which he may be seen from both sections, or at least from the one having the most important mission. The fire may then be controlled to a certain extent by arm signals. The section leader should, if practicable, observe the platoon leader in order to catch signals and facilitate communication.

12. Alternate positions.—*a.* If the enemy offers stubborn resistance, the machine guns may be required to fire for a considerable period of time. Continued firing from one position will eventually lead to its discovery. Poor concealment may result in machine guns being located by the enemy soon after fire is opened. Section leaders, therefore, select alternate firing positions to which they may move if necessary. When conditions permit, alternate positions are personally reconnoitered by the section leader. If it is impracticable to do this, the section leader, without leaving his post, decides on an alternate position which appears to be suitable.

b. A section leader has no authority to withdraw from a position and abandon his mission because of enemy fire. He may change the positions of his guns slightly to avoid enemy fire or to secure better cover. Orders for withdrawal come from the platoon leader.

13. Advance to subsequent positions.—*a.* The platoon advances to new firing positions when close support is no longer possible from its present position. The platoon leader decides when the movement of the machine guns will begin and the method of carrying out this movement. The entire platoon may move forward at the same time, but generally the platoon moves forward by advancing only one section at a time. The platoon leader, followed by one section, goes forward to select the new positions while the other section remains in position covering the advance of the leading section.

b. The platoon leader designates the section to go forward and the section to remain in position, or directs both sections to go forward, as the case may be. He points out, when practicable, the probable location of the next firing position and prescribes whether the guns will go forward on carts or by hand. He then goes forward to select the route of advance and the next firing position.

c. The section which is to move forward goes out of action. If the use of carts is practicable, the platoon leader directs that they be sent for. The

carts will be sent for by the section leader sending the message through the ammunition carriers, who connect the guns and carts. Equipment is prepared for loading and ammunition is collected while waiting for the carts.

d. The platoon leader precedes his platoon. The section follows as rapidly as practicable or at a distance prescribed by the platoon leader. The section leader orders a formation best suited to the situation, the idea being, as in approach march, to get to the next firing position with minimum losses. Defiladed routes are sought, every effort being made to keep out of sight of the enemy. If under observation of the enemy, the guns are generally carried by hand and the section takes up a formation similar to that used by near-by riflemen.

e. The section halts under cover in rear of the new firing position. When practicable, the platoon leader has a runner meet the advancing section to lead it by the best route.

f. The section leader goes forward, joins his platoon leader, and receives his orders for the occupation of the new position. The principles of entry into position are the same as those discussed for the taking up of the initial position. Greater difficulty may be experienced, as enemy fire will probably be heavier and the location of our troops and the enemy will be more difficult to determine. If the guns were not brought forward on carts, the men will be tired and ammunition will be limited. To maintain effective fire under these difficult conditions requires of the section leader skill and good leadership.

g. When one section is left in position, it continues to cover the advance while the other section is going forward. The platoon leader prescribes the time at which the section left in position will go forward. This may be on signal, at a prescribed time, or when the leading section goes into position or opens fire. Use of carts will be specified by the platoon leader. The rear section continues to fire as long as safety of friendly troops permits. It then remains on the alert, watching the flanks, gaps in the line of assaulting troops, and for low-flying airplanes. At the proper time it goes out of action and moves forward.

14. Consolidation.—*a.* When the attack halts for any reason, it is the duty of the machine guns to cover the front and flanks against counterattacks. The attack may stop at a predetermined objective; it may stop to enable commanders to reorganize their forces which have become scattered during the fight or to allow fresh troops to pass through and continue the attack; or it may be stopped by enemy fire. In any case great reliance is placed on the machine guns to hold off the enemy while the reorganization is going on or while the position is being prepared for defense.

b. In order to insure constant preparedness against counterattacks, machine-gun sections will have to give this protection from the firing positions in which they find themselves when the attack is halted. Any change in the locations of guns must be specifically ordered by the platoon leader.

15. Advance guards.—The section with an advance guard is employed in accordance with the principles of attack. Position in column and action, if the enemy is met, are prescribed by the platoon leader. An escort of about a squad may be assigned to machine-gun sections in isolated positions on the flanks. This escort is under the command of the section leader and is used as a patrol in advancing to positions. It covers the position of the section while firing.

Section III.—THE MACHINE-GUN SECTION IN DEFENSE

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16. General.—*a.* In the defense it is important that only the minimum of troops be actually engaged. This permits the concentration of fresh forces at a point of decisive action. The tactics of defensive action are essentially the tactics of holding extensive fronts with relatively weak forces. This is accom-

plished by occupying and defending critical points in depth rather than by scattering troops evenly along the entire front.

Machine guns, because of their characteristics, are specially adapted to the defense. Their tremendous fire power when properly applied enables them to replace large numbers of riflemen.

b. The section is the usual fire unit in the defense. Tactical disposition of machine guns is made by higher authority in accordance with the general plan. Definite positions and missions are assigned the section leader and, when possible, supervision is exercised by the platoon leader. During the hostile attack, however, fire missions are usually executed without the supervision of the platoon leader, due to the wide separation of machine-gun units in the defense and the consequent inability of the platoon leader to maintain control.

The most advantageous characteristics of machine guns can be fully utilized because of the deliberate siting which the defense permits. Single sections have therefore very important missions. The success of a defensive plan will frequently rest upon the ability of a machine-gun section leader to carry out his mission. It must be the determined purpose of the machine-gun section charged with defending a position to hold that position to the last or until competent authority orders a withdrawal.

17. Missions.—*a.* Machine guns are distributed throughout the defensive zone from front to rear, with the general mission of giving continuous resistance to an enemy attack. They are usually sited in pairs (by section), but they may be sited singly or in groups of one or more platoons. Each section is assigned a mission, and the mission forms a small but important part of the general plan. The guns of a section are preferably sited so that either gun may execute this mission.

b. The mission assigned a section may be one or a combination of the following:

(1) *To cover a given sector by employing direct laying on any suitable target which may appear in it.*—From the beginning of the attack, the enemy, as he advances, must pass through the sectors covered by the fire of the machine-gun sections employing direct laying. If he succeeds in penetrating the defensive zone, he encounters other sections farther in rear which have been sited primarily to resist such a penetration. Thus throughout the defensive zone machine guns offer continuous resistance to the hostile advance.

(2) *To protect a given position or line against assault by flanking fire.*—The section is sited so as to deliver a fixed band of grazing fire across the front or flanks of the position or line to be defended. This band of fire is known as the *final protective line.* When practicable, it is linked up with the final protective line of other sections so as to form a continuous belt of flanking fire. Gaps in this belt which can not be readily covered by machine guns are covered by automatic rifles, 3-inch trench mortars, and artillery.

(3) *To support counterattacks.*—Sections are sited to support the counterattacks of rifle units which are launched to regain lost positions. Such sections are generally located along support or reserve lines, and in addition to the foregoing mission they cover the flanks of front-line strong points, the intervals between same, and are prepared to cover the rear lines by flanking fire. If the counterattack is made in the sector of fire of a section, the section leader supports the counterattack on his own initiative or on the request of a rifle-unit commander. If the fire to support the counterattack is to be delivered outside of the sector assigned to the section, the orders for such fire will come from the platoon leader.

(4) *To deliver fire by indirect laying on given areas when called for.*—(*a*) Sections unable to deliver fire by direct laying at the beginning of the attack, because of intervening obstacles, are given a mission of delivering fire by indirect laying on enemy approaches or on important areas in response to the normal barrage (S O S). This fire mission, which is executed by indirect-laying methods, is first in order of occurrence in the attack but second in importance to the eventual mission, which is to deliver fire by direct laying in the given sector when the enemy appears.

(*b*) In order that all sections may be able to fire through fog, smoke, or darkness, arrangements are made to execute their missions by indirect laying. This fire is then delivered in response to prearranged signals or requests from rifle units.

(5) *To deliver antiaircraft fire.*—Certain sections are given special antiaircraft missions. Such sections are employed for local defense against observation and raids by low-flying hostile aircraft. They are sited to protect impor-

tant elements of the defense, such as strong points, command posts, combat trains, and routes of communication. They are responsible for firing on all low-flying hostile aircraft which appear over the area they are ordered to defend and within effective range of the machine guns. Protection against high-flying hostile aircraft is provided by antiaircraft units and the Air Service.

18. Selection of positions.—*a.* Taking over positions which are already occupied is discussed in paragraph 24. The matter herein refers to positions which are being occupied for the first time.

b. When troops assume the defensive, immediate disposition is made of machine-gun units. The platoon leader sites the guns of his sections to cover the area allotted to him and assigns a mission to each section. Occasionally in the deployed defensive the time available does not permit the definite siting of every gun by the platoon leader. A definite mission and the approximate positions of his guns are assigned the section leader. The latter will definitely select gun positions to carry out the mission. His freedom of selection will be limited to the areas assigned him. The general location of the guns should be such that friendly infantry may protect them from hostile assault.

c. In the selection of gun positions, the utilization of natural concealment is a consideration next in importance to the ability to carry out the mission. A concealed position for the gun and the crew which serves it must first be secured. A covered position in rear for the remaining members of the squad and supplies and a covered approach from that position to the gun position are next in order of importance. In selecting positions for guns in an area under constant observation from the front, cover against such observation must be considered first and then concealment from the air. In areas concealed from the front, cover from aerial observation must be given first consideration. The success of these positions will depend largely upon the surprise effect gained through their concealment. Natural cover from fire is less important than cover from observation. High grass, hedges, bushes, and growing crops afford good cover from observation from the front but little protection from fire. Woods and large clumps of bushes give additional concealment from aerial observation. Ground formations, such as folds, banks, ditches, and shell holes, give some concealment as well as protection against fire. A combination of both concealment and cover from fire should be sought. Ditches, banks, shell holes, and folds in the ground which are well concealed by high grass, trees, bushes, or hedges usually offer this combination. The same principles of concealment apply to the squad positions in rear of the gun and the routes of approach to the gun positions.

d. Available cover will influence the amount of interval between guns of the section. The interval is limited by two necessities; it must be great enough so that both guns will not be affected by a single bursting shell, and it must not be so great that the section leader will lose direct control of the section. The distance from the position of the gun to the position of the personnel not at the gun is chiefly determined by available cover. This distance must be such that a shell which destroys the gun can not injure the personnel not at the gun. It must be short enough to permit easy communication with the gun position, speedy replacement of casualties, and maintenance of an adequate supply of ammunition. Frequently it will be necessary to shelter the extra personnel of the section in a single covered position.

e. Alternate positions to be occupied only in case the first position becomes untenable are selected by the section leader in the absence of specific assignment by the platoon leader. The principles of concealment which apply to the first position apply also to the alternate positions. Alternate positions must permit at least partial performance of the original mission. They must be connected with the first position by a route concealed from enemy observation and, if possible, covered from fire.

19. Occupation of positions.—*a.* Instructions from the platoon leader to the section leader will indicate the time for occupation of positions, and generally the route of approach to them. The greatest care must be exercised in occupying defensive positions when they are under enemy observation. Detection by the enemy renders a machine-gun position practically worthless unless protected by bombproof cover. All unnecessary movement must be carefully avoided.

b. When gun positions are occupied in the presence of the enemy, the section leader will see that the guns are mounted in the vicinity of the position, that at least 3 boxes of ammunition are at each gun, that the mission is fully understood, and that a sentry is posted in observation before any work upon the preparation of the position is commenced.

20. **Preparation of positions.**—*a.* Preparation of positions will generally consist of improving the natural cover which already exists. In any case it will follow the rules governing cover as outlined in paragraph 18.

b. The section leader assigns the work of improving the position to the squads through the squad leaders. Each squad leader directly supervises the preparation of his own gun position, cover for the personnel, and route of approach to the gun.

c. Every care is exercised to prevent unnatural appearance of ground. Most positions will require some digging. Frequently a trench must be dug to provide a route of approach. The appearance of fresh earth indicates to the enemy that a defensive work is being constructed. Fresh earth must be carried out in sandbags and dumped in rear or carefully camouflaged. The use of a parapet of earth or sandbags is not advisable unless completely covered from observation by natural or artificial means. During the work the members of the squad must be prohibited from walking on any open ground in the vicinity of the gun. The covered approach alone must be used in moving back and forth from front to rear. Trampled grass and footpaths will assist the enemy in locating the position by observation from the air.

d. When the position is adequately prepared the gun is mounted in it. Construction of cover from fire, protection against hostile attack, and the improvement of the comfort and security of the personnel proceed and become more elaborate the longer the position is occupied.

e. After the initial work of preparation of the position has been assigned the section leader reconnoiters the vicinity of his position. He ascertains the location of adjacent units and secures all available information that will be of value to him in performing his mission.

f. If he has not already been furnished a range card for each gun by the platoon leader, he will construct simple cards, determining the ranges to important features in his field of fire from a map or from adjacent troops or by estimation. The cards are posted in the gun positions, being later replaced by more complete ones constructed at platoon or company headquarters.

21. **Action preceding and during hostile attack.**—*a.* Prior to a hostile attack the guns of the forward sections, if mounted, are laid during the day to fire on the most important part of their arcs of fire. Frequently guns are left dismounted in dugouts during artillery bombardment and throughout the day where there is inadequate cover for the gun positions. At night guns are mounted and laid on their night lines. The guns at night usually cover the same areas upon which they were laid during the day, but by indirect means.

b. A single sentry is in each gun position during the day. At night two sentries are at each gun. One sentry always remains at the gun, and the other is charged with watching for signals and transmitting them to the sentry at the gun and with waking the personnel of the squad.

c. At the beginning of a hostile attack prearranged signals are given by the forward observation groups. If given at night or during smoke or fog, the forward sections open immediately on their night lines. Night attacks are generally local affairs in the nature of raids. If the enemy attacks in the daytime, forward guns hold their fire until the gunners observe favorable targets unless the attacking troops are obscured by smoke or fog. To do otherwise would mean the unnecessary disclosure of their positions. Enemy scouts that appear are not fired on. The first enemy wave that appears is met by deliberately aimed fire. The fire is controlled by the squad and section leaders. The most favorable targets are always fired upon. Circumstances will determine whether skirmish lines that take cover in the prone position should be abandoned in favor of standing skirmishers or deeper targets which may appear in rear. In the event of an assault on a position or line which is being defended, the sections switch to their final protective lines at the verbal or signaled command of the section leaders. The maximum rate is employed on the final protective lines.

d. Orders to support a counterattack launched to regain a portion of the line which has been lost are issued by the platoon leader. A request for support from a rifle-unit commander direct to the section leader should be complied with if the situation permits. Small local penetrations usually occur, but they are not serious if adjacent machine guns still holding out are able to assist in driving them back. The machine guns should immobilize the enemy with flanking fire while supporting troops during a counterattack.

e. In all the firing and especially that on the final protective line, where success depends upon continuity of fire, the section leader coordinates the firing of the two guns so that as nearly as practicable an even and continuous volume of fire is delivered.

f. The section leader must supervise the supply of ammunition and water by keeping in close communication with the ammunition details of each gun squad.

g. When an attack is not imminent, sections in rear which can be moved without exposure may be withdrawn temporarily from their battle emplacements to assist in performing special tasks of harassing fire. Such firing will be under the direct control of an officer.

h. The antiaircraft mission is performed by designated sections. The mission is generally executed from specially prepared emplacements which are occupied at the order of the platoon leader.

i. When not engaged in the performance of a special mission, such as harassing or antiaircraft fire, the sections occupy their battle emplacements. The guns, if mounted, are laid on the most important parts of their respective sectors of fire. Guns defiladed from the front are laid on their normal barrage (S O S) lines, covering some important enemy approach. Upon receipt of the normal barrage (S O S) signal from the forward observation groups, the sections open fire in accordance with existing orders. Firing is continued for a specified time or until orders to cease firing are received. Close vigilance must be maintained to assure immediate application of fire by direct laying upon any targets which appear at any point in the field of fire. Enemy penetrations will not necessarily appear to the front. Frequently they will appear on the flanks and even to the rear. They are first met with deliberately aimed fire or, when circumstances require, by the swinging traverse.

22. Supply.—*a.* The supply of food, water, ammunition, and spare parts is obtained by the section from the platoon munitions-distributing point. Supplies are brought by hand to the covered positions of the personnel of the squads.

b. At least half of the ammunition and spare parts are kept at the gun positions if time has permitted the construction of shelters. Generally, in the defensive, a minimum of 2,000 rounds of ammunition, one complete set of spare parts, and a number of grenades must be kept at each gun position. Each alternate emplacement should contain several boxes of ammunition.

23. Trench routine.—*a.* A schedule of trench routine is arranged by the company commander or the platoon leader and is published by the section leader to his section. The schedule of trench routine usually supplements and always conforms to general orders prescribing the routine for the command. It should be posted conspicuously in the dugouts or quarters of the squad. The section leader is responsible for exact performance by his section of the duties prescribed by the schedule.

b. Besides those regular daily duties for the security of the defensive sector, a general police of emplacements, trenches, and dugouts is prescribed. Guns, ammunition, and spare parts are cleaned daily. Repair work and improvement of the position go on constantly. When possible, bathing facilities are provided for the personnel.

c. Security is maintained by a system of sentries for each gun position described in paragraph 21*b*, and such additional sentries as the situation may require. Orders for sentries at the guns are conspicuously posted in each emplacement. Every member of the gun squad will be required to memorize the orders.

The schedule of routine prescribes in detail the manner, time, and place of conducting stand-to formations. Generally, at the stand-to all personnel of the squads don their equipment and assume designated posts, as, for example, the gun crews take their positions at the guns, the petty officers take posts from which they can observe the front and flanks and control the fire, certain members take up designated posts on the flanks, and the remaining numbers stay in the dugout.

The section leader must inspect every stand-to to make sure that the requirements are being strictly adhered to.

24. Reliefs.—*a.* Relief orders issued by higher authority specify the manner in which the proposed relief will be conducted. Reliefs are conducted in the

daytime only when an unavoidable necessity demands it. Each incoming unit, including the section, is guided to its position by a member of the outgoing unit. The place where the guides will meet the incoming units is prescribed in their orders.

b. Certain details that must be attended to by the section leaders in a relief are general and are not necessarily referred to in orders.

The outgoing section leader must see that gun positions, dugouts, and trenches are clean and that ammunition, trench stores, range cards, and all written orders or instructions are in shape to be turned over without delay to the leader of the incoming section. Upon the arrival of the incoming section, the sentry at each gun will dismount his gun and tripod and mount the gun of the incoming squad, laying it on the proper line of aim. This will be done in the presence of the incoming and outgoing squad leaders and the new sentries designated for the first relief. The new sentries will at this time receive the special orders for the gun emplacement and thereupon relieve the old sentries. The outgoing squad leader will explain fully the mission of the gun and give all important information in his possession concerning the enemy, friendly troops, and the manner of performing the mission. The range card will be carefully explained. Information for both gun positions is similarly transmitted by the outgoing section leader to the incoming section leader. Finally, the incoming squad and section leaders will sign receipts for all ammunition, equipment, trench stores, range cards, and written orders and instructions. A copy of the receipt is retained by each of the persons concerned. The relief is thereupon complete, and the information is immediately transmitted by the outgoing section leader to platoon headquarters. When prescribed in orders, one member per gun of the outgoing section will remain in the position for 24 hours after the relief.

c. Upon completion of the relief the outgoing section leader will conduct his section by the designated route to the assembly point of his platoon or company. The leader of the section in position will make a thorough inspection to insure that orders and instructions are clearly understood, that a system of relief of sentries has been provided by each gun commander, and that the guns are properly laid. At the first favorable opportunity the section leader will carry out so much of the reconnaissance prescribed in paragraph 20*e* as is necessary.

25. Withdrawal.—Orders from higher authority prescribe the detailed manner, the time, and the route of withdrawal of a section. Withdrawal of the section will not take place except by order of higher authority.

26. Rear guard.—*a.* The mission of machine guns in the rear guard is to delay the enemy so as to permit the main body to deploy or retreat. Their fire power is especially useful for this purpose.

b. Sections of a platoon in the rear guard are maneuvered by the platoon leader. They usually withdraw alternately within the platoon from firing position to firing position. Selection and occupation of firing positions and conduct of fire follow generally the principles of the defense. It is of particular importance to secure wide, clear fields of fire at medium and long ranges.

c. An escort of about a squad of riflemen should be assigned to machine-gun sections in isolated positions to provide for local protection whenever no other rifle troops are near by. This escort is under command of the machine-gun section leader. The retirement of a section is covered by its rifle escort. The rifle escort remains in position covering the section until the guns are loaded on the carts and started to the rear. It then follows as a patrol.

27. Outpost.—*a.* Machine guns in the outpost assist in securing the main body against surprise when halted and cover deployment in case of an attack. The guns are widely distributed to protect the front and flanks. Generally, a proportion of the guns are kept in reserve. Likely approaches, such as roads, woods, and defiles, are swept by machine-gun fire.

b. The combat principles of the section in defense govern the section in outpost.

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TRAINING REGULATIONS, NO. 420–130

INFANTRY

Combat Principles—The Machine-Gun Platoon

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Section I.—MACHINE-GUN CHARACTERISTICS

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1. **Necessity for understanding.**—Machine-gun characteristics are those peculiarities or qualities which distinguish a machine gun from other weapons. It is essential that every officer and petty officer of the machine-gun company have a knowledge of characteristics, for upon these are based the tactics of the weapon. A careful study of all its principal characteristics is required. It would be wrong to base the use of the gun upon one characteristic, such as its fire power, without regard to other features.

2. **Definition of machine gun.**—The term "machine gun" has acquired the following generally accepted definition:

A *machine gun* is a weapon gun that fires small-arms ammunition on the automatic principle, supported by some form of fixed mount in such a way that the direction of fire is capable of being clamped.

3. **Distinction from other weapons.**—In general, the Browning machine gun is characterized as being a rather light, portable weapon, firing rifle ammunition automatically at a high rate. It is capable of sustained fire, due to positive recoil operation and water-cooling. The tripod mount allows the gun to be clamped securely in any direction.

a. The machine gun has certain characteristics which are sufficiently similar to the characteristics of the rifle and automatic rifle to warrant a brief comparison.

b. The rifle fires the same ammunition and has the same mean trajectory. The rifleman thinks in terms of a single shot; the machine gunner in terms of a cone. The cone from one or more rifles and the cone from the machine gun will differ greatly even though there are the same number of shots in each cone. The dispersion of the machine gun is much less than an equal amount of rifle fire. Thus the effective range of the machine gun is greater. The weight of the machine gun makes it far less mobile than the rifle.

The automatic rifle fires the same ammunition as the machine gun and at approximately the same cyclic rate, but its usable rate of fire and effective range are much less than the machine gun. Its mobility is about the same as that of the rifle and is greater than that of the machine gun. The automatic rifle having no fixed amount is not well suited for overhead fire or indirect laying. The machine gun, because of its fixed mount and small dispersion, is suitable for these purposes.

c. It will be noted that the machine gun has greater fire power, greater effective range, and less mobility than the rifle or automatic rifle.

4. **Mode of action.**—Machine guns act through fire power alone. They are a powerful auxiliary to rifle units. When only fixed fire is needed, it will be proper to use machine guns in conjunction with 3-inch trench mortars and supporting artillery. Riflemen are thus economized and become available for tasks requiring movement. In the attack, machine guns assist in the preparation, in gaining and maintaining fire superiority, in covering the advance, and in breaking up counterattacks. In the defense they assist in covering the front and are important members in the framework of the defensive system. The gun has little power of destruction against matériel. The machine gun is, therefore, generally employed to keep down the fire of hostile infantry and machine guns, to destroy personnel in the open, to cover the front and flanks of strong points with flanking fire, to immobilize personnel under cover, or to deny the personnel the use of areas. In all of the above the employment of machine guns is coordinated with other weapons, each being assigned missions and targets best suited to its powers and limitations.

5. **The mount and its effect.**—*a.* The fixed mount is a distinguishing feature of the machine gun. By means of the mount the gun can be clamped in elevation and direction. This lessens the effect of the personal factor in firing, even when the firer is under the strain of excitement or fatigue. The fixed mount makes possible the small dispersion and the close grouping. Overhead fire can be used, within certain limits, without danger to friendly troops. The ability to maintain the laying in direction and elevation makes indirect laying practicable.

b. An effective fire can be placed upon a given line or area under all conditions of visibility. This makes it particularly useful in night firing, or when the target becomes masked by rain, fog, or smoke. Employment with outposts or in defense, where guns are laid to cover avenues of approach or sweep areas of lines through which the enemy must pass, is an example of the application of this characteristic.

c. Accuracy and close grouping of shots can be obtained at long ranges. Favorable targets beyond the range of effective rifle fire may profitably be engaged by machine guns. In the attack, machine guns can take up the fire fight and cover the advance of friendly riflemen until they are within effective rifle range of the enemy. In the defense they can force the enemy to deploy at ranges where rifle fire would have little effect.

d. Fire may be adjusted by observing the strike of the bullets and then making necessary corrections.

6. **Fire power.**—*a.* By merely pulling the trigger, 400 to 500 shots per minute can be fired. This is the *cyclic rate* and must be distinguished from the *usable rate* of fire. Two hundred and fifty rounds per minute is about the maximum usable rate of fire. The firing is done in bursts of from 5 to 50 rounds, with a pause after each burst to check the aim or to relay on other parts of the target. When engaging moving targets or those which require searching and traversing in order to cover them completely, the number of rounds the gunner is able to fire for any length of time is about 100 per minute.

b. The rifle equivalent is variable and depends upon the range and the direction of the fire with respect to the target. It is ordinarily assumed that the fire effect of a single machine gun is equivalent to that of from 25 to 50 rifles. The rapidity of production and application of a large volume of accurate fire favors its use for surprise effect.

c. Due to the better cooling system and heavier mechanical construction, the machine gun, unlike the automatic rifle, is able to maintain a high rate of fire for a considerable period of time. Thus it is of value in fire preparation and in barrage firing, where areas or lines are kept under fire for a considerable length of time.

d. The expenditure of ammunition is very great. Ammunition supply must be carefully organized and expenditure carefully regulated. This is not as difficult in the defense as in the attack, where ammunition must be carried forward in limited quantities.

e. Stoppages or accidental cessations of fire constitute an unfavorable characteristic which must be considered in connection with the fire power. This liability to stoppage, together with tactical considerations, makes it advisable to use machine guns in pairs. Generally both guns of the section are assigned the same target or sector so that in case of the stoppage of one gun the other may continue to fire.

7. **The cone of fire and beaten zone.**—*a.* Small dispersion, high rate of fire, and a rather flat trajectory give a narrow, dense cone, with a resulting long,

narrow, and compact beaten zone. When firing over level or uniformly sloping ground at a range of 700 yards the height of the cone above the ground does not exceed the height of a man.

b. As the range increases the trajectory becomes higher and higher to the extent that fire over masks such as hills, woods, houses, etc., by indirect laying may be employed. With certain limitations for safety, it is practicable to fire over the heads of friendly troops.

c. The machine gun can be used to fire on points or areas where the enemy is or is expected to be. It is not suited for sniping or firing on small, unimportant targets.

d. The small dispersion of the gun has a direct bearing upon the accuracy with which the range must be determined. At the longer ranges a slight error in range or direction will throw the cone off the target. Machine-gun crews must be highly trained in range estimation.

8. All-around traverse.—The Browning machine gun may be turned in any direction without moving the mount. While this is not literally true of all machine guns, still the ease with which the direction of fire may be changed justifies the statement that all machine guns have an all-around traverse. This quality makes for flexibility of fire. Counterattacks on the flank or unexpected targets in any direction can be quickly engaged without movement or with only slight movement of the gun and crew. Guns located on the flanks are able to cover gaps between units or to protect the flanks when one unit advances farther than another. This wide arc of fire of the machine gun, together with its great fire power, makes it particularly valuable in defense, outposts, and rear guards.

9. Ease of control.—The great fire power of the machine gun is in the hands of one man, the gunner, who is able to turn it in any direction. Control, therefore, is simple. Fire orders are more easily transmitted to this single man than to an equivalent number of riflemen.

10. Mobility.—*a.* The methods used to transport machine guns and their ammunition are—

(1) By carts or packs on mules.
(2) By motor cars.
(3) By hand.

b. When carried by the first method over open terrain machine guns have the same mobility as the riflemen they accompany.

When carried in motor cars machine guns are more mobile than riflemen on foot, but they are restricted to roads.

When it becomes necessary for the crew to carry the guns and equipment the mobility of the machine gun is less than that of the riflemen. To increase the mobility of the machine gun, leaders must be resolute and the crew consist of robust men exercised in carrying full equipment. Leaders must be taught to select easy, defiladed routes of advance permitting use of transport to the fullest extent and to move into position under cover.

c. In action, movement by hand is frequently necessary, since guns which are in close support of the rifle companies are seldom able to get to their positions on transport. Over terrain where the transport can not follow closely the entire movement is by hand.

d. Machine guns are not able to open fire quickly except when mounted in their firing positions. In the attack, movement into position requires time because the guns are kept far enough in rear to enable them to move to suitable firing positions without marching by the flank. Careful reconnaissance by platoon leaders in advance of their platoons insures prompt action on the part of the machine guns and close support of the rifle companies.

11. Vulnerability.—*a.* In route column machine-gun units are very vulnerable to machine-gun or rifle fire. In advance guards, rear guards, approach marches, or withdrawals they will be so placed in the formation that they will not be surprised and immobilized or destroyed by small-arms fire. In our service they are, in principle, covered by the rifles of a battalion when in draft.

b. Emplaced, in the defense or in the attack, one or two men are sufficient to operate the gun. Casualties among the crew will not decrease the fire power so long as ammunition is at hand. All members of the squad must be trained to handle the gun, and replacement of casualties should be automatic in a well-trained squad. The gun, with two men to operate it, occupies but a few square feet, and when well concealed is hard to locate and difficult to destroy. Machine guns are carefully watched for by the enemy and promptly draw fire when located either in or out of action.

12. Ease of concealment.—*a.* The small area occupied by the machine gun and the men required to serve it enables them to use effectively the slightest cover. Such features as folds in the ground, weeds, and débris will effectively conceal a machine gun from view. The distinctive noise of the gun, dust from the muzzle blast, steam, and flash (at night) tend to disclose the position. There is much that may be done to lessen these disadvantages. When time permits, all of these unfavorable characteristics except the noise can effectively be guarded against by careful concealment. With effective concealment the noise discloses the presence of the machine gun but not necessarily the location of the position.

b. Emplacements, either hasty or permanent, are small and not difficult to conceal.

c. In cramped localities, a machine gun may be placed where an equivalent number of rifles could not find room.

13. Summary.—Too much stress can not be laid on concealment and surprise effect. The small size and great fire power of the machine gun adapt it to this method of employment. The rapid, regular explosions of the gun, together with the crackling of the bullets in the air, has a decided psychological effect on an enemy, the troops it is supporting, and on the gunner himself. The gunner soon acquires a sense of power and invulnerability. This confidence must be encouraged. The machine gunner should be taught that in the attack his support is extremely valuable; that in defense his support is decisive; that during the hostile advance to the assault machine guns assist materially in breaking up the attack; that during the assault they are greatly relied upon to repulse the assault by flanking fire.

Section II.—GENERAL

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14. Composition of the machine-gun platoon.—The machine-gun platoon consists of a headquarters and four machine-gun squads, with their transportation and equipment.

15. Organization.—For purposes of combat the platoon is organized into a headquarters group and two sections of two guns each.

a. The platoon headquarters is composed of the personnel necessary to direct and control the sections and movements of the platoon and to maintain communication within the platoon and with the commanders concerned with its actions. The personnel of the platoon headquarters consists of—

(1) The ensign, who directs and controls the sections of the platoon.

(2) The platoon chief petty officer, who is second in command and assistant to the ensign.

(3) The petty officer agent, who is in charge of the runners and agents and who usually represents the platoon leader at the headquarters of the rifle company when the platoon is supporting a rifle company.

(4) The transport petty officer, who is in charge of the platoon transportation and is responsible to the platoon leader for its maintenance and movements.

(5) Seven seamen, who are used as runners.

b. The section is commanded by the section petty officer and is divided into two machine-gun squads, each composed of 1 petty officer and 10 seamen with one machine gun. The organization and functions of the sections are treated in detail in TR 420–125.

c. The transportation of the machine-gun platoon consists of eight 1-mule combat carts. (The navy will use Cole carts par. 13–29.) If the company is not operating as a unit, the carts generally accompany the platoons to which they pertain. When equipment is removed from the carts and carried forward by hand, the immediate command of the transportation passes to the transport petty officer. He handles the transportation in accordance with the instructions of the platoon commander. A runner from platoon headquarters is assigned to the transport petty officer to carry messages to platoon headquarters and the battalion munitions distributing point. The transport petty officer is responsible for the supply of ammunition to the platoon munitions distributing point. The transport petty officer is charged with keeping the carts as close to the guns during action as is consistent with concealment and cover, in order that the platoon may quickly make use of them if the opportunity arises.

16. Command.—The platoon is the normal machine-gun combat unit. As such it remains under the direct command of the machine-gun platoon leader, who acts under the orders of his own company commander, unless command has been assigned otherwise. A machine-gun platoon operating with a detached unit or a security group will usually be directly under the command of the officer commanding the rifle unit with which it is operating. In the attack or in the defense when the platoon is operating as a part of the battalion the platoon leader commands his platoon under the orders of the machine-gun company commander.

Section III.—THE MACHINE-GUN PLATOON IN ATTACK

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17. General principles of attack.—The success of an attack depends on a correct combination of fire and movement. The riflemen, with the assistance and protection of friendly fire, close with the enemy and seize the ground which he occupies. Part of this friendly fire the riflemen themselves can furnish, but they can not advance without decreasing both the volume and accuracy of their fire. The fire power of the machine gun makes it an important factor in the struggle for fire superiority. It is the mission of machine-gun commanders in the attack to assist the advance by neutralizing enemy fire. They must make judicious use of any latitude allowed them in the selection of targets and positions. They must exercise energy and initiative in the selection of targets and positions from which targets can be engaged to best advantage. Their efforts in this respect are not confined to the support of the particular unit with which they are operating, but should be extended to the support of neighboring units whenever favorable opportunities present themselves.

18. Employment with assault battalions.—*a.* The platoon in the attack may operate as a part of an assault battalion, a reserve battalion, or as a part of a machine-gun group. When a part of a reserve battalion or machine-gun group the platoon leader acts directly under the orders of the machine-gun company or group commander.

b. When operating as a part of an assault battalion the machine-gun platoon may be used in one of the following ways:

(1) In direct support of one or more assault companies.

(2) As a part of the machine-gun company acting as a unit in support of the assault.

(3) As a reserve platoon.

c. The combat principles of the machine-gun platoon in the attack relate chiefly to the conduct of platoons employed according to the first method mentioned above. The second method is explained in TR 420–135. The conduct of a platoon acting as a reserve with an assault battalion will be governed by the principles which govern the two previous cases, depending upon what use is made of the platoon. If the platoon in reserve is committed to action, it will act separately in support of one or more assault companies or it will join the other platoon and the company will support the attack as a unit.

19. Approach march.—*a.* Each assault battalion goes forward to the attack with its machine-gun company. In the approach march before deployment the machine-gun company is intact under the command of the machine-gun company commander. When deployment becomes necessary the company commander directs the method of deployment of the platoon. He may then regulate the further advance of the deployed company as a whole or make immediate disposition of the platoon according to paragraph 18.

b. The platoon leader directs the advances of his sections after deployment in such manner as to reach the first firing position with a minimum of exposure and loss of time. This is best done by taking advantage of the natural features of the terrain and by disguising the nature of the platoon by assuming a formation similar to that of adjacent rifle units.

20. Reconnaissance.—*a.* Prior to combat, the platoon leader will make such personal reconnaissance as may be directed by the company commander. He will also inform himself as thoroughly as possible of the situation by a study of available maps and such intelligence reports as may be at the company headquarters.

b. During the progress of the attack the platoon leader will personally reconnoiter for firing positions and routes of advance to them. He will make full use of maps and field glasses in studying the nature of the terrain to the front. His reconnaissance is supplemented by information received from the reconnaissance officer and company commander.

21. Selection of positions and targets.—*a.* The location of the first firing position and the targets to be engaged from it are usually designated by the company commander. In this case the platoon leader assigns positions in the platoon firing position to the sections and apportions the target or targets between them.

b. If the first firing position has not been designated by a higher commander, the platoon leader will himself select the position for the platoon. The position selected and the targets to be engaged from it will depend on the mission assigned to the platoon. After selecting the platoon position, the platoon leader will assign positions and tasks to the sections.

c. The primary consideration in the selection of a machine-gun position from which to support an attack is the possibility of delivering fire from it without the fire being masked by the advance of our own troops. A position on commanding ground from which overhead fire can be delivered offers the best firing position for supporting an attack. Such a position will be selected whenever possible. When commanding ground is not available it may be necessary to arrange with the rifle units for intervals to be made through which the machine guns can fire. It may be necessary to place machine guns in the firing line. The secondary considerations in the selection of firing positions are ease of access, cover, and concealment.

22. Determination of ranges.—When the initial firing position and targets are designated by the company commander, his orders will usually include the ranges. If for any reason the ranges are not furnished by the company commander they will be determined by the platoon leader on arrival at the platoon position. Ranges may be determined from the map, by estimation, by range finder, or by fire for adjustment. Range finding by fire for adjustment will be exceptional.

23. Issuing orders.—The platoon leader will issue his orders to the section leaders on the ground to be occupied. In these orders he explains the situation, the mission of the platoon, the part each section is to play, the position to be occupied, targets to be engaged, ranges to be used, arrangements for supply, and the time for opening fire.

24. Occupation of positions.—In occupying positions, the first consideration must be to get the platoon into position with the fewest possible casualties and without being seen. The platoon should always advance along a predetermined route. It is led by the platoon leader or guided by runners from him. In occupying positions the sections may be separated by some distance, in which case the platoon leader will supervise the occupation of position of the most important section, which is generally the most advanced section. If positions can not be occupied without discovery by the enemy, the position will be entered rapidly and boldly and the sections placed in action as rapidly as possible. One section may be placed in position and used to cover the occupation of position by the other section. These principles of occupation of positions apply both to the occupation of the initial position and the occupation of subsequent positions during the advance.

25. Conduct of fire.—The platoon leader will personally direct the conduct of the fire of the platoon whenever practicable. Fire from the initial position will usually be opened on command of the company commander or at a time designated by him. In other cases, the platoon leader will decide when fire is to be opened. In any case, the platoon leader will see that fire is opened at the proper time whether acting under specific orders from the company commander

or on his own initiative. He sees that the sections receive orders as to the rate and kind of fire to be employed and the targets to be engaged. He keeps close watch on the sections, so that any necessary changes or corrections can be made promptly. He communicates directly with both section leaders verbally, by signal, or messenger.

26. Supply.—Before entering action the platoon leader must see that the supply of ammunition, water, oil, and spare parts is adequate. When the platoon carts are left at his disposal by the company commander, he is responsible for the replenishment of ammunition from the battalion munitions distributing point. He makes arrangements for the supply of the sections from the carts and keeps the sections informed as to the location of the carts and the platoon munitions distributing point if one is established. The platoon leader is responsible for the supply of his platoon. His actions will be governed by the arrangements made by the company commander for the supply of the company.

27. Transportation.—*a.* The use to be made of the carts may be prescribed by the company commander or the carts may be placed at the disposal of the platoon leader. The carts will always be used in bringing the guns up to the initial firing position if such action is practicable. Their use for further advance during the action will depend on the nature of the terrain and hostile fire. Opportunities are constantly sought to use the carts when advancing the guns to subsequent firing positions. Since the carts will always be kept under cover where cover is available, their proximity to the firing position will often determine the practicability of using them to transport the guns to the next firing position. In an attack of any consequence, the use of carts for transporting the guns beyond the initial position will be rare. However, they must be kept as far forward as possible in order to be available for possible use and to reduce the distance which ammunition must be carried.

b. When the location of the carts is not prescribed by the company commander and the carts are left at the disposal of the platoon, the platoon leader will handle the carts through the transport petty officer in such a way as to keep them as nearly constantly available as possible.

28. Communication.—Communication within the platoon and between the platoon and the company is usually by runners. One runner from the platoon is sent to the machine-gun company headquarters. When the platoon is supporting a rifle company, the petty officer agent and two runners are sent to the commanding officer of the rifle company. They keep the platoon leader informed of the situation and needs of the rifle company, targets, firing positions, and routes of approach. The other runners of the platoon are used for maintaining communication with the sections and with the transportation.

29. Advancing to subsequent positions.—*a.* The time at which to advance from the initial position to a new firing position may be prescribed by the company commander. When the platoon is acting in support of one or more rifle companies, the time at which to advance to subsequent positions is usually decided by the platoon leader.

b. The decision to advance to a new firing position will be governed by several considerations. The platoon will fire from its initial position as long as its fire is of value to the advancing troops. When the fire is masked by the advance of friendly troops or when for any other reason is no longer practicable the platoon leader takes steps to advance the platoon to a new firing position. This movement must be made promptly and energetically in order that the platoon may maintain close touch with the rifle companies.

c. The new positions and the routes to them may be designated by the company commander, or they may be chosen by the platoon leader on his own initiative. The latter is usually the case when the platoon is acting in support of a rifle company.

d. The normal method of advancing the platoon is by section. One section advances to a new firing position while the other section remains in position firing or ready to fire. The section remaining in position continues to support the attack by fire if targets are seen which can be fired on without endangering friendly troops. It must be ready to meet any hostile counterattack. It usually remains in position until the advanced section has occupied its new firing position. The platoon leader, accompanied by one or more runners, precedes the platoon to the new firing position. Before leaving he prescribes the method of advance to be used and the route to be followed. He may designate the time of movement for one or both sections; he may direct one or both sections

to follow at a given distance, or he may arrange for their advance by signal or runner.

e. The platoon leader reconnoiters for a new firing position and a route of advance to it. If necessary, he marks the route of advance by runners or other methods. Normally both sections will follow the same route of advance. The location of the new firing position depends on the terrain, the progress of the assault units, and the resistance they are encountering. The platoon leader must keep informed of the needs of the rifle company which his platoon is supporting.

f. When the sections arrive at the new positions the platoon leader indicates their positions to them, designates the targets to be engaged, prescribes the rates and kind of fire to be employed, and, in general, conducts their fire as at the first firing position.

30. Consolidation.—*a.* When a position has been gained and consolidation begins the machine guns must be disposed to give the greatest possible assistance in holding the captured position. The action may be a transition from the attack to the defense or merely a halt to permit reorganization. It is during this period of consolidation that enemy counterattacks may be expected. The quickly developed fire power of machine guns is relied upon to give the chief protection in consolidation.

b. The positions of machine guns in the consolidation are approximately those just previously used in the support of the attack, except that rear platoons or sections may be ordered up. When time permits the platoon leader may modify the siting of certain guns which have been forced, during the attack, to take positions unsuitable for the defensive nature of the consolidation. In such cases the change of position must be rapid and entail as little movement as possible. All guns should be constantly ready to meet a hostile counterattack.

31. In advance guard.—*a.* The principles governing the use of machine guns in an advance guard are, with slight modifications, the same as those governing the use of machine guns in the attack or in defense, depending on whether the character of the advance-guard action is for the moment offensive or defensive. The ability of the machine gun to develop a large amount of fire in a short time makes it particularly valuable in an advance-guard action. Machine guns assist in securing an uninterrupted advance of the main body by driving back the enemy's advance troops or they assist in covering the deployment of the main body by seizing and holding favorable ground. Machine guns should always form a part of an advance guard as large as a battalion, and will usually be attached to an advance guard as large as a rifle company. An advance guard smaller than a rifle company usually will not be accompanied by machine guns, as the small total depth of the formation does not give protection to the guns while marching on the road in draft.

b. Position in advance guard.—Guns must be moved on carts, as the weight of gun and equipment makes it impossible for a machine-gun unit to transport by hand and keep up with the march of the riflemen except for very short distances. The machine guns with an advance guard on the march should be at such a position in the formation as will insure them against being destroyed or immobilized by the small-arms fire of the enemy. A machine-gun platoon with an advance guard of one rifle company will always march with the support. A machine-gun company acting with a battalion will normally march as a unit with the reserve, but one platoon may march with the support when the country is rolling or wooded, so that an opportunity to prepare for action under cover from hostile observation and fire may be expected. Machine guns are generally placed at the tail of the subdivision with which they are marching. The machine-gun unit is under the direct command of the commander of the subdivision, support, or reserve to which it is assigned. If the platoon is acting as a part of the company, the company commander exercises command over the platoon.

c. The necessity for quick development of fire will usually require that the reconnaissance be hastily conducted and with less thoroughness than in the attack. It is more important that the guns be mounted quickly in a position where they can fire than that the position selected be the best that could be found after careful examination of all the ground in the vicinity. Very frequently the reconnaisance will be made by the advance guard or machine-gun company commander while the platoon leader is either in his march position in the column or while he is coming forward. The firing positions for his

platoon will be pointed out to him and his only task will be to get his guns into action and open fire on targets which have been allotted him.

d. If a machine-gun platoon with the advance guard is ordered to take up a position on a flank and at a considerable distance from the rifle troops, it is usually furnished with an escort of riflemen. A section of rifles is normally a suitable escort for a platoon of machine guns. The platoon leader utilizes the escort to protect his platoon in the approach to the position, and upon arrival disposes it to cover the flanks against hostile patrols.

Section IV.—THE MACHINE-GUN PLATOON IN DEFENSE

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32. General principles of defense.—*a.* It is important in the defense that the number of troops exposed to the fire of the enemy be reduced as much as possible in order to minimize casualties in the earlier stages of the action and conserve an effective force to be used, as an example, for counterattack. Proper employment of machine guns renders this economy possible, since, by means of their tremendous stopping power, they are able to replace relatively large numbers of riflemen.

b. Machine guns are distributed throughout the defensive zone to insure continuous resistance to the advance of the enemy. To insure that all important areas are swept by machine-gun fire and to economize the number of machine guns necessary to accomplish this result, distribution of machine guns is worked out and coordinated by higher authority according to a general plan. The degree of this coordination depends on the time available and the circumstances of the action.

33. Missions.—When the defensive is assumed, the machine-gun platoon is assigned a mission by the company commander and a position in the defensive zone from which to execute the mission. The mission assigned to the platoon in defense may be one or a combination of the following:

a. To fire on a favorable target which may appear in a definitely designated sector.—The guns are sited to bring fire by indirect laying on favorable enemy targets throughout the defensive zone.

b. To stop assaults.—Guns are sited, if possible, so that there may be cooperation between them. They sweep the area in front of their own units and of adjacent units with interlocking bands and cones of fire. The sections which are sited to offer resistance to the enemy by direct laying are given final protective lines. These lines should, in as far as the ground permits, form an impenetrable belt of fire in front of the position which the guns are defending. Arrangements are made for gaps in these belts to be covered by automatic rifles, 3-inch trench mortars, or artillery.

c. To support counterattacks.—All guns from front to rear are sited, if possible, so as to enable them to support friendly counterattacks.

d. To deliver protective fire on areas in response to signal.—Guns which have been assigned positions from which they are unable to deliver fire by direct laying at the beginning of the attack are given the mission of delivering protective fire by indirect laying on enemy approaches in the outpost zone. This mission is first in order of performance during the hostile attack. It is secondary, however, in importance to the eventual mission of the guns, which is to limit, by employing direct laying, hostile penetration of the defensive zone.

e. To deliver harassing fire.—When a hostile attack is not imminent, guns in rear can be safely withdrawn for a short time, singly or in batteries, for

the purpose of delivering harassing fire. Sensitive points within the enemy's line are engaged according to a definite plan worked out by the company commander or higher authority. Upon completion of the mission the guns are returned to their battle emplacements.

f. To deliver antiaircraft fire.—Certain guns from front to rear in the defensive system are given special antiaircraft missions. They are equipped with antiaircraft matériel and occupy specially prepared emplacements. The antiaircraft mission is performed in addition to the foregoing missions. (See TR 420–125.)

g. In reserve.—Machine guns whose positions are so far to the rear in the defensive system that they can not be employed in the earlier stages of the enemy attack are given reserve missions. Guns in reserve have prepared positions which they may occupy in case of an attack, or they may be maneuvered to other points in the defensive area where the need of them has been made urgent by an unexpected development of the hostile advance.

34. Selection of positions.—*a.* When the defensive is assumed, the general location of the platoon will usually be designated in accordance with the plan of the battalion commander. Where possible, even the exact location of sections in the defense will be ordered by higher authority, but in many cases the responsibility of siting sections will fall to the platoon leader. In such cases the platoon leader will make an immediate report by sketch of the detailed disposition of his platoon to his company commander.

b. In siting the guns of his platoon, the platoon leader must be guided primarily by a consideration of his mission. How best to accomplish his mission by proper selection of the positions for his sections requires a thorough knowledge of the characteristics of machine guns.

c. The mission will consist chiefly of instructions to defend a designated area to the front or flanks. The guns of the platoon must be sited to cover that area, but more especially those portions of it over which the enemy's advance is most likely to come. Fire will be delivered in a direction that will insure the most favorable effect. The most favorable effect is secured by enfilade fire. Most enemy targets will be shallow skirmish lines. Such targets are very unfavorable if fired upon frontally, but become favorable targets for machine guns which have been sited to fire upon them from a flank.

d. Machine guns are, are a rule, sited in pairs. The section is the fire unit. The method of siting the section in defense is discussed in detail in TR 420–125.

e. The distance between the sections of the platoon is governed entirely by circumstances. To secure ease of control and to facilitate supply and communication they are sited as close together as is consistent with the mission. This distance seldom permits direct control by verbal command or signal on account of the wide distribution of machine guns that is usually necessary in defense. Usually the company commander, when the situation permits, assigns missions which permit control of the sections of the platoon from rear to front rather than laterally. Control from rear to front is made easier and more practical than lateral control except when the lateral distance between sections is very small.

f. Natural concealment from observation and cover from fire will influence to a certain extent the selection of positions. The platoon leader will select positions for his sections which afford the best concealment and cover consistent with a proper execution of his mission. Cover for personnel and covered routes to the gun emplacements and between sections will be sought.

g. Alternate emplacements, to be occupied only when the first emplacement is discovered and becomes untenable, will be selected for each gun of the platoon. Alternate positions will be at least 100 yards from the regular position. The selection of alternate emplacements conforms to the principles outlined above. To be of value, alternate emplacements must have concealed approaches leading from the regular positions and must permit the guns to execute their regular missions.

h. The platoon leader locates his C. P. in such a position that he is able to command his platoon most effectively. Concealed approaches to both sections and to the rear and ability to observe will govern the location.

35. Defense of special features.—Guns are sited so as to cover ground over which the advance will come. A knowledge of the habits of the attacking troops will aid in determining the most likely enemy approaches. Troops when tired or heavily burdened avoid hedges, small woods, rocky or broken ground

and marshes, and bunch up on roads, in ravines, and in clear spaces between woods. Such features also promise defilade. In an effort to avoid fire, troops drift toward low ground, such as valleys, creek bottoms, and sunken roads. Machine guns sited to cover such features will secure favorable targets.

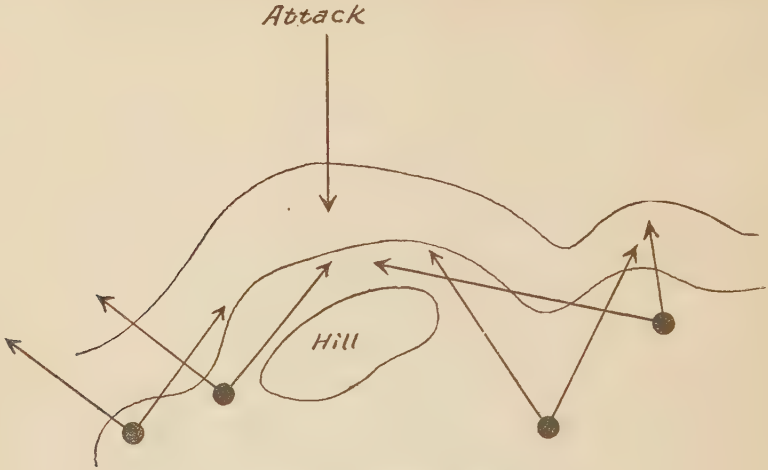

PLATE 84.—Defense of hill

a. Hills.—A hill is better defended from the flank than by placing guns on the hill itself. Guns will be placed on the shoulders of the hill or upon adjacent high ground so as to sweep the forward slope with fire which will strike the enemy's probable attack formation in flank.

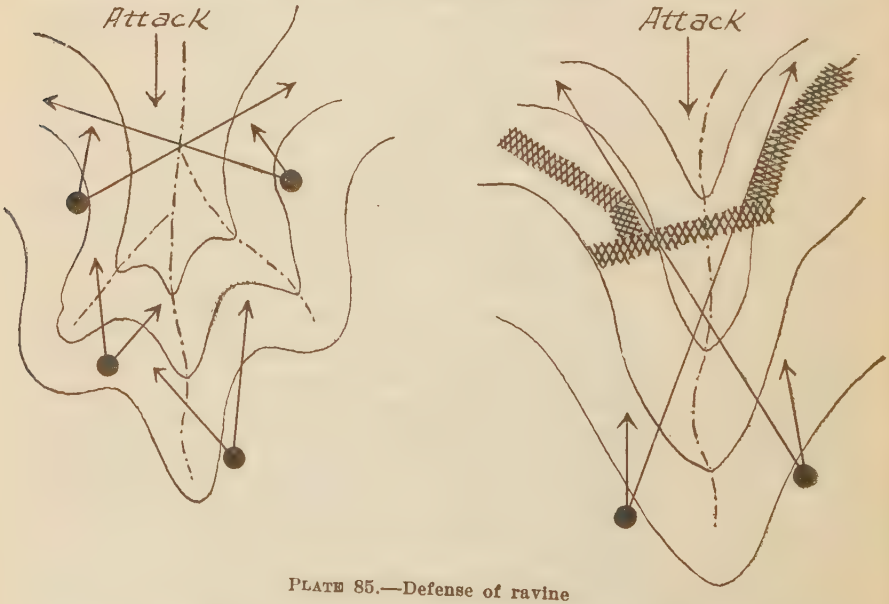

PLATE 85.—Defense of ravine

b. Ravines.—Guns are usually placed at the head of important ravines or on the flanks so that they can sweep the sides and enfilade enemy lines advancing to the heights. A large ravine may be closed by placing guns behind forward spurs so as to sweep the entrance and the high ground on the opposite side. Such guns are flanked by guns along the edge of the ravine farther back.

c. Ridges.—A ridge is best swept by long diagonal bands of fire across its face. Guns farther in rear are placed to enfilade the crest.

d. Woods.—Woods afford good concealment and free circulation. In large woods interior strong points should be organized. Positions are constructed well inside the edge and on high ground so as to avoid gas pools. Fire avenues

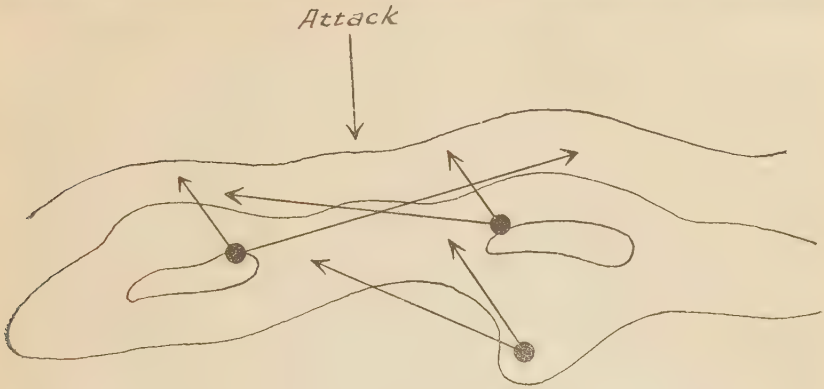

PLATE 86.—Defense of ridge

2 yards wide and sloping diagonally forward should be trimmed out of the underbrush. Care must be taken not to cut openings in the tops of the trees which will show on airplane photographs. An attack through woods nearly always results in an uneven advance or disorganization of the attacking forces.

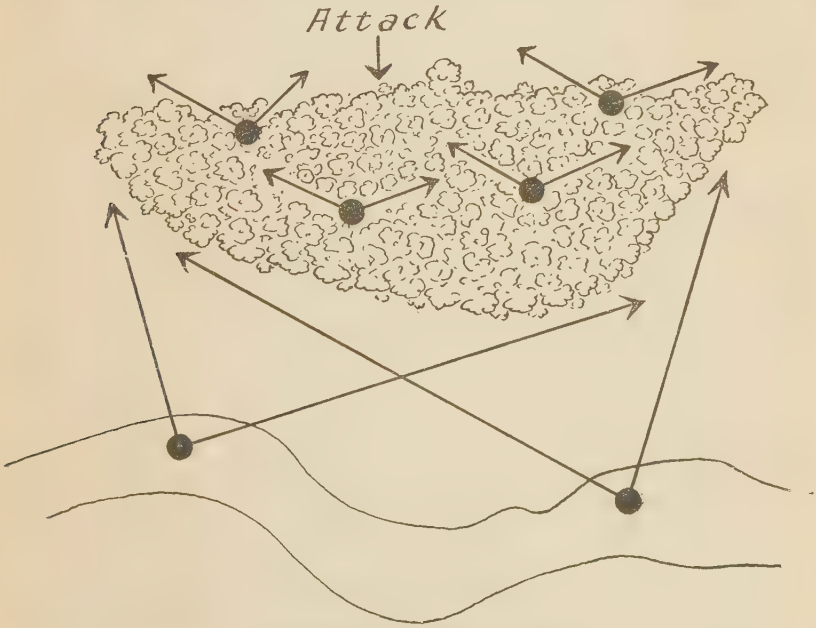

PLATE 87.—Defense of woods

Guns sited in rear so as to enfilade the back and side of the woods will hold the attacking forces within the woods, where artillery fire may be directed upon them.

Small woods are normally avoided by the enemy in his attack and are made the target of hostile artillery concentrations. Machine guns defending a

small woods should be sited outside the woods and in such positions that they can sweep its front and flanks.

e. Villages.—Small villages, like small woods, are usually attacked from the flank or rear. Unless the village has been organized with bombproof emplacements it is better to keep the machine guns out of it. The defense should be from the flank or rear.

36. Occupation of positions.—*a.* Taking over defensive positions already occupied by other troops is discussed in paragraph 40.

b. In occupying new defensive positions the platoon leader will, when there is sufficient time, conduct his section leaders to the positions he has selected and indicate to them their missions, sectors of fire, and manner of bringing their sections forward. He may also give them instructions concerning the preparation of their positions. When time is lacking it may be possible for a platoon leader to designate only the approximate positions of the guns. In such cases the section leaders will have to be depended upon to locate their guns to carry out the missions assigned and to make the proper use of ground and cover. Every precaution must be exercised to prevent discovery of the machine-gun positions by the enemy. Where the concealment is such that detection is improbable, positions may be occupied by day, but all unnecessary movement must be carefully avoided. Where cover is not adequate, the positions must be occupied by night. When the defensive is assumed in the daytime and it is necessary to place the machine guns in action immediately, temporary positions are occupied until nightfall.

37. Preparation of positions.—The platoon leader is responsible for the preparation of the position and for the later development and improvement of the work. Preparation of the position may sometimes begin after reconnaissance and before its actual occupation. In any case it should always be started as soon as possible after a position is occupied. The platoon leader will issue the necessary instructions to the section leaders as to the location and type of the emplacements and of the cover to be constructed for the gun crews. He will see that proper range cards are provided at the gun positions and that data to permit the firing of the guns by indirect laying methods in darkness or fog are obtained and recorded thereon, and that the necessary direction stakes are established. As time permits, he will supervise the improvement of the work begun. Care must be exercised to insure that proper measures are taken to camouflage excavations and paths. Splinter-proof overhead cover at the gun, obstacles around the position, and bombproof dugouts for personnel are constructed in time. The platoon leader's C. P. is prepared by runners of platoon headquarters under the supervision of the platoon chief petty officer.

38. Action of guns prior to and during hostile attack.—The platoon leader will see that all ranks are thoroughly familiar with all the details of the action to be taken in case of an enemy attack. The conditions of the battle field will usually make it impossible for the platoon leader to exercise personal control over his sections once the actual fight has begun. A great deal of responsibility must necessarily rest on the section leaders and they will be called on to make most of the decisions as to the targets to be engaged and the time at which fire is to be opened. They must, therefore, be given detailed instructions as to how they will perform their missions, the signals to be used by the rifle units, when to fire, and when to close on final protective lines. The platoon leader will not be content with giving instructions to the section leaders, but will make frequent inspections to see that his instructions are carried out and his orders are understood. He will question the section leaders as to what they will do under different conditions of a possible enemy attack. He examines sentinels at the gun positions to see that they understand the range cards and know the action they are to take in the absence of other orders when the enemy advances or when signals are received from rifle units.

39. Trench routine.—When a position is occupied for a considerable period, a schedule of routine duties will usually be ordered by the company commander. This schedule will prescribe the hours for alert formations, how they will be conducted, times and arrangements for messing, and periods of rest and fatigue. The platoon leader exacts strict adherence to this schedule. The two chief causes of low morale on the part of troops in the continued occupation of trenches are idleness and physical discomfort. Troops are more contented when they are busy at some useful occupation. Work done in improving their own positions tends to keep them contented and, at the same time, strengthens the positions and increases the comfort of the men.

40. **Relief.**—The method of conducting the relief down to and including the machine-gun platoon is generally prescribed in a relief order issued by higher authority. Certain general principles usually not included in the relief order apply to the relief of the machine-gun section. These principles are laid down to fit a normal situation in TR 420–125. Prior to the relief, the platoon leader sees that the detailed arrangements for the relief of each section are understood by each section leader.

41. **Withdrawal.**—The machine-gun platoon leader must keep his platoon in position unless ordered to withdraw by his company commander. No matter what zone or line he is in, no discretion on his part is permitted. An outpost zone or first line must be stubbornly defended as any other position. The company commander will inquire concerning possible withdrawals and see that guns are not needlessly sacrificed. Platoon leaders may order the removal of guns to alternate positions to avoid shelling, but have no authority to order the abandonment of a position.

42. **Rear guard.**—The function of a rear guard is to delay the advance of the enemy and afford time for the withdrawal of the main body. A rear-guard action is almost entirely a fire action and its mission is to offer the greatest possible resistance to the enemy's advance consistent with the escape and withdrawal of the rear guard to a new position. Fire is usually opened at long and medium ranges. Certainty of inflicting casualties on the enemy and forcing his deployment determine the time at which fire is opened. Opportunities to ambush the enemy at close range will be taken advantage of. The ability of machine guns to deliver effective long-range fire makes them extremely valuable for rear-guard duty and they should constitute a large percentage of the strength of any rear guard. When the enemy is not in close contact with the rear guard, the machine guns are usually transported on carts. The command of machine guns with a rear guard is governed by the principles for command in outpost laid down in paragraph 48. Four to eight riflemen per machine gun should be detailed for the local protection of the machine guns when the rear guard is in action. Their function is to post themselves to the flanks of the guns and prevent guns from being outflanked by small patrols of the enemy.

43. **Selection of positions for rear guard.**—The reconnaissance during a rear-guard action is continuous, and successive positions in rear must be selected in advance. The platoon leaders rarely precede their platoons to the rear for this purpose. If the platoon is acting as part of the machine-gun company, the reconnaissance is usually made by the company commander or his reconnaissance officer. If the platoon is acting alone, the platoon chief petty officer usually makes the reconnaissance. The first position is usually occupied in two lines, the rear within supporting distance of the front. Guns in rear echelons should cover the withdrawal of guns nearest the enemy. This method of withdrawal is continuous throughout the action and the whole of the rear guard will never retire at the same time. Successive machine-gun positions to cover the withdrawal and reorganization of rear-guard elements will be from 800 to 1,200 yards in rear of each other and should be chosen with a view to wide fields of fire and of observation and fire at long and medium ranges. Dead space at close range is not a particular disadvantage unless stubborn resistance is to be offered for a considerable time. Roads and approaches, such as ravines leading into or to the rear of friendly positions, must be covered. Ease of withdrawal is essential. It is desirable that guns retire under cover of the ground as soon as they move out of their firing positions. This requires positions on crests, in woods, or on the sides of ravines. Backgrounds will be carefully considered and the guns placed in the least obvious positions. Usually there will be little time for the construction of cover from fire and it will be necessary to make use of natural features for cover and concealment. Lines of retirement must be reconnoitered with a view to defilade from hostile rifle and machine-gun fire. Roads will be used for retirement when possible.

44. **Withdrawal to successive positions.**—Orders for withdrawal are given by the rear-guard commander. It is not the function of the machine-gun platoon leader to decide for himself when he will withdraw, but as there will be uncertainty in the transmission of orders he must keep in touch with near-by rifle commanders in order that he may not be left behind due to failure to receive the order to withdraw. When the platoon is acting alone, sections will usually be withdrawn successively. The platoon chief petty officer precedes the first section to withdraw and selects the next firing position for it, in accordance with instructions from the platoon leader. (He posts runners to guide the sec-

tion into its new firing position.) The platoon leader remains with the section which is still firing and at the proper time conducts it to a firing position in the rear. Frequent opportunities for employing carts occur in the rear guard and full use should be made of them. The function of the rear guard is to escape, if possible, and offer further resistance on a new line. Its mission, however, is to insure the escape of the main body, and guns must be sacrificed if this result can not be obtained otherwise. There is no justification for guns being abandoned before they have accomplished their mission. It is better to lose a portion of the rear guard than to allow the enemy to fall on the flank or rear of the main body and change the retirement into a rout.

45. Rifle escort.—An escort of riflemen is usually assigned to a machine-gun platoon in rear guard, as in the advance guard, to protect the flanks of the machine-gun position.

46. Machine guns in flank guard.—The principles governing the use of machine guns in flank guards are the same as those governing their use in advance or rear guards. The application of the principles is, however, more difficult.

47. Machine guns in outpost.—The function of an outpost is to protect the main body from a surprise attack and to offer resistance until the main body has time to deploy for action. The machine gun is well suited for delivering the bulk of the fire power for outpost resistance. The general principles governing the use of machine guns in all species of defense apply to their employment in an outpost. The chief differences are that the proportion of machine guns to rifles may properly be larger in an outpost than for other defense; the time during which resistance is to be offered without reinforcement is shorter in an outpost action than in any other defensive action; until reinforced, the outpost will seldom be called on to execute a counterattack against the enemy in force.

48. Command of machine guns in outpost.—Machine guns assigned to an outpost are under the control and command of the outpost commander. While posted with any of the subdivisions of an outpost their command is usually specifically assigned by the outpost commander to the subdivision commander.

49. Disposition of machine guns in outpost.—Machine guns with an outpost will not ordinarily be placed in front of the lines on which resistance is to be offered. They may be mounted in the support line, held with the reserve, or be assigned to both the support and the reserve. Positions are selected for the guns in the reserve which will permit them to take part in the fight in event the enemy attacks from any direction. When the enemy attacks, the guns in the reserve are moved into the proper positions to meet the attack. In exceptional cases a very few guns may be posted in advance of the line of support to command some vital feature of the terrain. Frequently two positions for the guns—one for day and one for night use—will be provided. Guns may not be mounted during the day if there is danger that their positions will be located by the enemy. They may be held near their positions and mounted only in case of an attack. Guns in the support lines are always mounted at night. They take up their night positions at dusk in order that they may be laid by direct methods and arrangements may be made for fire after dark by indirect laying methods.

50. Considerations governing siting of machine guns in outpost.—Machine guns with an outpost are not ordinarily sited for as complete a defense of the whole front as is the case in ordinary defense. Their missions are more likely to be the covering of roads and important avenues of approach, defending important areas in the outpost position, and strengthening the weak points of the line. If the advance or withdrawal is to be resumed in a short time, they are usually not placed far from the main artery of travel.

TRAINING REGULATIONS, NO. 420-135

INFANTRY

Combat Principles—The Machine-Gun Company

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Section I.—GENERAL

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1. Composition.—Officer and enlisted personnel, animals, transportation, and arms of the machine-gun company are prescribed in Tables of Organization.

2. Organization.—For the purpose of combat the machine-gun company is organized into a company headquarters and two (three) platoons. The company headquarters is composed of a command group and an administrative and supply group. The command group and the two (three) platoons constitute the forward echelon of the company. The administrative and supply group constitutes the rear echelon.

The headquarters group and the two platoons constitute the forward echelon of the company. The train group and the kitchen and administrative group constitute the rear echelon.

3. Command group.—*a. Functions.*—The command group contains that personnel of the company which is necessary for the purpose of—

(1) Obtaining the information on which the company acts.

(2) Maintaining communication within the company and with commanders concerned with the actions of the company.

(3) Transmitting orders and information to the elements of the company.

(4) Directing and controlling the actions and movements of the company.

b. Personnel.—The personnel of the command group consists of—

(1) The company commander, who directs and controls the actions of the company.

(2) The reconnaissance officer and reconnaissance petty officer, who obtain information. (See par. 39 *b.*)

(3) The signal petty officer and signalman, who receive and transmit information.

(4) Two buglers, who assist in receiving and transmitting information.

(5) Seven seamen, who maintain communication.

(6) The chief petty officer, who assists the company commander in keeping the command group functioning during combat.

4. Two platoons.—The organization and functions of the platoons are treated in detail in TR 420-130.

5. Train.—*a. Source.*—The train is made up of certain transportation, animals, and personnel provided by the regimental service company and of certain personnel of the machine-gun company. (See Tables of Organization.)

b. Division.—The train is divided into a combat section consisting of the combat wagons, the rolling kitchen, and the water cart and a field section consisting of the escort wagon and the ration cart.

c. Personnel.—(1) The regimental service company supplies the personnel required to handle the transportation and the animals of the train. Two wagoners or assistant wagoners are supplied with each four-mule team and one wagoner or assistant wagoner with each two-mule team.

(2) The train personnel of the machine-gun company consists of the stable petty officer, the saddler, the horseshoer, a stable orderly, and a motorcyclist. This personnel keeps the animals of the train and of the company in a serviceable condition and assists in keeping the trains functioning according to the will of the company commander. This group is a part of the nucleus around which reorganization is effected in case the company becomes depleted.

6. Administrative and supply group.—*a. Functions.*—The functions of the administrative and supply group are: To secure, prepare, and distribute rations for the company; to secure and issue supplies; to carry on routine administrative matters; to provide a nucleus around which reorganization may be effected in case the company becomes so depleted that it can no longer continue to operate.

b. Personnel.—The personnel of the administrative and supply group consists of—

(1) The second in command, who is the senior lieutenant (junior grade) and commands the rear echelon of the company.

(2) The commissary steward, who procures supplies for the company.

(3) The commissary steward, who superintends the preparation and distribution of rations.

(4) The yeoman, who keeps the records of the company.

(5) Three cooks, who prepare the rations.

(6) Two mess cooks, who assist in procuring and handling supplies.

(7) The barber, the cobbler, and the tailor, who act as kitchen police, replacements, or perform such duties as the second in command prescribes.

(8) Such runners from company headquarters as may be necessary to maintain communication between the group and the company commander are attached to the administrative and supply group.

7. Command.—The machine-gun company is an integral part of the infantry battalion, and decision as to its tactical use rests, therefore, with the battalion commander.

If one or more platoons of the company are detailed to support the action of a rifle unit which is acting with its battalion, the command of such platoons remains with the machine-gun company commander. If a platoon is attached to a rifle unit the question of command is determined under the provisions of United States Navy Regulations. This relation as to tactical decision and command remains relatively the same when the machine-gun company is acting as part of an advance guard, rear guard, or outpost.

When machine-gun companies are withdrawn from their battalions for the purpose of executing a special mission, the question of tactical decision rests with the commander responsible for the execution of the special mission.

8. Relation to other units.—The machine-gun company is capable of little or no independent action. It can not take ground and it can not hold ground indefinitely without the assistance of rifle units. Machine guns act by fire alone. The machine-gun company covers by fire the movements of the rifle companies which close with the enemy and take ground. They cover by fire the front and flanks of rifle units which hold ground. In performing these tasks the machine guns assist and are themselves assisted by the artillery units and howitzer company platoon. The general missions of these three are the same, but their methods of execution, their powers, and their limitations are different.

The machine-gun company commander works in closest harmony with the commander of the accompanying artillery and the commander of the howitzer company platoon.

Section II.—IN ATTACK

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9. General.—The success of an attack, other things being equal, depends upon a proper combination of fire and movement. By fire, the strong points of the enemy defenses are neutralized or immobilized. By movement, the weak points are broken through and a maneuver is executed to place the strong points at a disadvantage.

As the attack progresses, infantry must depend more and more on its own resources to produce such fire power as will insure an advance. For the infantry, the machine-gun companies are an important source of fire power.

Machine guns are distributed over the entire depth of the attack and exert a continuous effort throughout the action. The quality of the machine-gun support may be the factor which determines the success or failure of the attack.

10. Companies of assault battalions.—Machine-gun companies of assault battalions always accompany their battalions in the attack.

11. Methods of employment.—The company is generally employed in one of the following ways:

a. As a unit, personally controlled by the company commander.

b. A platoon may be assigned to support the attack of each rifle company when there are two rifle companies in the assault echelon, the platoons acting directly under the platoon commanders.

c. One platoon may be placed in support of an assault company or the entire assault echelon of the battalion, and the other platoon held in reserve.

When the company deploys, the company commander assigns to the platoons their missions, provided they have not already been assigned, and the future use of the company is then known or can be foreseen. At the same time he establishes the location of company headquarters (C. P.) and his forward observation post (O. P.). Company headquarters is usually at or near battalion headquarters. The company commander's observation post is usually with the battalion commander.

12. Approach march.—*a. Position in formation.*—In the approach march the position of the machine-gun company in the formation is ordered by the battalion commander. If the early use of the company is probable, it should march in rear of the assault rifle companies of the battalion. If early use is not probable, it marches in rear of the reserve rifle company. If the battalion is going to pass through a battalion already in position, it may be helpful to place the machine-gun company in front of the assault companies. This permits the machine guns to arrive early on the ground and to assist in covering deployment. For the purpose of control the company is held intact as long as the situation will permit.

b. Deployment.—When enemy fire or the tactical situation renders it inadvisable to march the company any further as a unit in the formation it is deployed by the company commander. In deploying the company assumes a formation which will minimize casualties and conceal its identity as a machine-gun organization. Such a formation is usually that assumed by the adjacent rifle companies. After deployment it becomes the object of the company to

arrive at firing positions with the fewest possible casualties and without being seen by the enemy.

13. **Reconnaissance.**—*a. Before the attack.*—Before the machine-gun company enters an action such reconnaissance is made as time and the situation permit. A careful study is made of the map to determine the nature of the terrain over which the attack will be made. Intelligence summaries and aerial photographs are studied to ascertain the probable location and strength of the enemy defenses, and all sources of information are consulted in order to arrive at a comprehensive view of the situation. In addition to this, whenever practicable, the company commander, accompanied by such officers and men of the company as he thinks advisable, will visit the ground and reconnoiter for first firing positions, routes of approach, location of munitions distributing points, and positions for the carts.

b. During the attack.—It is essential that reconnaissance be continuous throughout the action. The company commander is responsible that proper reconnaissance is made. The reconnaissance officer and the reconnaissance petty officer assist the company commander in this duty and carry out such reconnaissance as he may direct.

The reconnaissance party operates well to the front. The best routes of advance and the best firing positions for the company within or near the battalion zone of advance are selected. Those responsible for reconnaissance constantly anticipate the probable actions and positions of the enemy and keep prepared to conduct the company into proper firing positions with a minimum of delay and exposure should enemy resistance or activity be encountered.

A careful study of the map in conjunction with the study of the ground and the frequent use of field glasses is of great assistance in making a reconnaissance.

14. **Selection of positions and targets.**—When an occasion arises for the machine-gun company to go into action, the battalion commander assigns missions and approximate positions to the company. The machine-gun company commander keeps constantly in touch with the situation and is always prepared to make recommendations to the battalion commander as to the proper use of the machine guns in any situation. The mission and the location of the positions assigned by the battalion commander will usually be in general terms. The company commander must exercise initiative and ingenuity in working out the details in order to execute the mission in the most effective and most economical manner. Such positions and targets are selected for the platoons as will best promote the plan of the battalion commander. The positions selected are properly such that support can be given to the attack without interference with the maneuvering of rifle units. If available, commanding ground is occupied in order to secure overhead fire. Positions permitting flanking fire are occupied whenever possible. Fire is usually frontal in the attack and opportunities for enfilade fire are, as a rule, the result of careful selection of positions. As the attack progresses some parts of the line will advance more rapidly than others, and this will present opportunities for flanking fire on the enemy in front of the units which are advancing slowly. Full advantage is taken of such opportunities to assist neighboring units and inflict casualties on the enemy. The targets selected are those best suited to the characteristics of the weapons and the needs of the situation.

15. **Determination of ranges.**—Having decided on the positions and the targets for the guns, the company commander then causes the ranges to the various targets to be determined by such means as are available. Ranges may be determined by the reconnaissance petty officer reading them directly with the range finder; they may be measured from the maps; they may be obtained from troops on the ground who have previously determined them; or they may be determined by estimate. Time may not permit or it may become otherwise impracticable for the company commander to determine the ranges. In such case they will have to be determined by the platoons when they arrive in position. If the situation permits, ranges to target and to probable targets are determined by fire for adjustment.

16. **Issuing orders and assigning targets.**—The orders of the company commander are issued on the ground whenever practicable. Platoon leaders and such petty officers as are desired to hear the order are caused to report to the company commander at a designated time and place. This group is conducted to a position from which the situation can be explained and locations pointed out. There, orders are issued and targets and positions are assigned

to the platoons. If orders can not be issued on the ground, the company commander may send to the platoon leaders by runners such information and orders as will insure that the platoons act in accordance with the requirements of the situation.

17. **Occupation of positions.**—The first consideration in occupying positions is to get the company into the position with the least possible loss and without exposing it to enemy observation. To accomplish this purpose, it may be necessary to place one platoon in position and use its fire to cover the occupation of position by the other platoon. The positions of the platoons may often be separated by a considerable distance. In such case the company commander should supervise the occupation of position of the most important platoon, which is generally the most advanced platoon. If positions can not be occupied without certain discovery by the enemy, the position should be entered rapidly and boldly, the guns being brought into action as soon as possible.

18. **Cover and concealment.**—In the attack, cover from fire will seldom be found, and time for preparing cover will rarely be available, but advantage should be taken of such natural features as are present. In the attack, concealed positions carefully selected and occupied are generally of greater value than visible positions which afford cover from fire. Observation from both ground and air must be considered in seeking concealment. Natural features such as reverse slopes, woods, brush, standing crops, and tall weeds are taken advantage of to secure concealment. It is essential that the company commander must exercise good judgment in the selection of cover and concealment. Those positions which are obvious or which afford easy registration points for the enemy artillery are avoided.

19. **Conduct of fire.**—The company commander directs the fire of the company whenever practicable. It will seldom be possible to control the fire of the company by verbal commands and for that reason the time of opening fire, the rate and kind of fire to be employed, and the targets to be engaged are previously designated by the company commander. If any changes or corrections are desired during the course of the firing, the company commander goes personally to the unit concerned or else transmits his orders by signals or runners. All necessary arrangements are made to insure that the company's action is in accordance with the situation and the preconceived plan of action.

20. **Supply.**—One of the chief concerns of the company commander is the supply of the company. In advancing, the company is constantly moving away from its source of supply, and at the same time it is consuming the supplies on hand. The difficulty of keeping the company supplied with food, ammunition, water, spare parts, and oil increases as the attack progresses and demands increasing attention from the company commander.

It is the duty of the rear echelon of the company to supply the forward echelon with all that is required in the attack. To insure the continuity of supply, it is essential that requirements be anticipated and that steps be taken in advance to meet them.

21. **Transportation.**—To save the men unnecessary fatigue, guns and ammunition are carried on the carts as long as the situation permits. When the company goes into action the carts are brought up as close to the firing positions as the terrain and enemy fire will allow. The company commander prescribes the disposition of the carts while the guns are in position. The carts may be held at the point at which the equipment was removed; they may be concealed in the vicinity of the positions; they may be sent to the rear to refill or for safety; or they may be placed at the disposal of their respective platoon leaders.

22. Communication.—*a. Means.*—Communication within the company, between the company and the battalion, and between the company and the regiment is maintained by runners. Signals, telephones, or other means may be employed, but in the attack opportunities for their effective use are rare.

b. Within the company.—Each platoon sends one runner to company headquarters. The duty of this runner is to carry messages from the company commander to the platoon to which he belongs and to keep the company commander informed of the location of that platoon.

Company headquarters sends such runners as are necessary to the rear echelon of the company. These runners are used by the second in command to keep the company commander informed as to the location of the rear echelon and the condition of supplies.

c. Between the company and other headquarters.—Two runners are sent to the battalion message center. These runners are used to carry messages from battalion headquarters to the machine-gun company commander.

23. Advancing to subsequent positions.—While the company is in position firing, the reconnaissance officer, accompanied by such runners as are necessary for communication, remains forward with the assault echelon. He keeps in touch with the situation, looks for further advanced firing positions and routes of approach, and transmits this information to the company commander. If the company is acting as a unit, the company commander is prepared to make recommendation to the battalion commander as to the time for commencing the forward movement of the company. If the platoons are acting separately or attached to a rifle unit, the time for beginning the advance is determined by the proper commander. Before the company or any element of it advances, a careful study of the ground is made in order to locate the features which give cover and command. This is supplemented by a study of the map, when possible, in order to ascertain the nature of the terrain which is not visible from the present position.

When the company is acting as a unit and the platoons are close together it is generally best to advance the company by echelon, moving one platoon at a time. If the platoons are widely separated, it is better to advance a section from each platoon rather than to advance a whole platoon. The manner in which the advance is conducted will be controlled by the situation and the terrain. Advantage is taken of all such opportunities which may permit of the whole company advancing at one time. The platoons or sections advance from firing position to firing position, except when the location of the next firing position can not be determined in advance, in which case they will move forward at such time as will keep them within supporting distance of the assault echelon of the battalion. Short moves are avoided, and no movement is begun until it is apparent that friendly troops will gain possession of the next firing position.

The company commander precedes the company to the next firing positions and selects the route which the company will follow. Runners are posted along the route to guide the company when there is danger of its becoming lost or confused with other organizations.

The company commander decides on the general location of the guns of the platoons, selects and allocates the targets, and, if practicable, determines the ranges.

The first units of the company to arrive at the new position are put into action as quickly as possible. In order that support may be continuous, these first units are placed in any available positions which will satisfy the requirements of the situation. As soon as arrangements have been made to get the leading units into action against the desired targets, steps are taken to bring up the other units to the new positions selected for them.

If the situation permits, the company commander, before leaving the old position, may designate the time at which the rear units will move forward. A signal may be prearranged to control the movements of the rear elements, or a runner may be sent back to guide them up. While the rear sections or platoons are coming forward an effort is made to find positions for them which will permit flanking or oblique fire on the enemy.

The carts are used for moves whenever the situation permits. This will seldom be possible for the first units which go forward. Carts are brought up as close to the firing positions as the terrain and enemy fire permit, and may occasionally be available for moving the rear units forward to the new positions.

The formation adopted for the advance is generally that of the neighboring rifle units. Such a formation aids in concealing the identity of the machine-gun units.

24. Covering reorganization.—All elements of an attack do not progress uniformly. Units become separated from their commands, casualties deplete the ranks, and disorganization results. At such times it is necessary to halt the attack and reorganize before continuing the advance. When an assault battalion is halted for reorganization, the machine-gun company is disposed at once to cover the front and the flanks of the battalion. Since an enemy counterattack may be expected at this time, it is essential that the position selected be such as will give good fields of fire and afford the maximum security to the disorganized battalion. The machine guns are the chief source of protection at this time and are to be used boldly and energetically.

There are two requirements which usually conflict in the selection of positions to cover reorganization: That they be good defensive positions and that they permit supporting fire at the resumption of the attack. The situation will decide which is the more important requirement in any case.

25. Resuming attack after reorganization.—When the attack is halted for reorganization, fire superiority may be lost, and in such case it will then be necessary to regain it before the advance can be resumed. Machine guns are specially valuable in regaining fire superiority and assisting the resumption of the advance, all available guns being used for that purpose.

The positions satisfying the requirements of supporting fire at the resumption of the attack may often be different from those used in covering reorganization. The company commander considers this during the reorganization, and if the positions first occupied do not permit of effective supporting fire he makes such changes as may be necessary.

These new positions are occupied in time to assist in the preparatory fire. The company commander exercises care and judgment in moving to the new positions in order that the guns may not be caught en route by a surprise action of the enemy.

26. Line halted by resistance.—When the battalion is halted by resistance it is necessary to neutralize or destroy that resistance before the advance can be resumed. In order to overcome the hostile resistance and regain fire superiority, all available fire power is used. All guns of the machine-gun company should at once be placed in positions from which they can fire on the enemy holding up the advance.

Rapidity of decision and action is required in this case. Time is not to be wasted in seeking for ideal positions. Guns are mounted in available positions as quickly as possible and open fire at a rate as rapid as the condition of the ammunition supply will permit.

If the situation requires it, the company commanders site machine guns in the line of riflemen.

27. Consolidation.—One of the most important functions of machine guns in the atack is to assist in holding ground which has been gained. At the conclusion of the attack rifle units may be seriously depleted and disorganized and the men so exhausted mentally and physically that they retain little power of resistance. It is then that the machine guns can give invaluable assistance to the infantry battalions by promptly occupying and defending the ground gained by the riflemen.

When the attack has a limited objective or when it is supported by massed artillery it may be found advantageous to withhold some of the machine guns from support of the attack in order that they be ready to render more prompt and more efficient support in the consolidation.

As soon as the objective has been gained or a halt has been ordered, preparation for the defense of the ground gained is begun immediately. This step marks transition from an offensive to a defensive character of action. The rôle of the machine-gun company is much the same in consolidation as in reorganization. The selection of gun positions may be more careful and more deliberate because there is more time available.

The first duty of the machine-gun units will be to protect the rifle units for whose protection they have been specially detailed. The platoon leader, under supervision of the rifle company commander, provides first for the protection of the front and flanks of the particular rifle company which it has supported. The machine-gun company commander, under supervision of the battalion commander, provides for the protection of the front and flanks of the whole battalion. Coordination is then secured between the elements of the company and between the company and the machine-gun companies of neighboring battalions.

28. Companies of reserve battalions.—While the companies of reserve infantry battalions should habitually be tactically available to proper battalion commanders, they may, under exceptional circumstances, be withdrawn from their battalions and used for some special mission. In deciding upon their use in executing the special mission, the necessity therefor should be carefully weighed against the importance of readiness to insure continuity of effort in the later action.

29. As part of a group.—*a. Forming the group.*—If the necessity exists, machine-gun companies of reserve infantry battalions may be withdrawn in the initial stages of the attack and formed into groups organized for some special

purpose. The execution of this mission should usually be limited to fire from designated positions and movement of the companies forward from these positions will be exceptional until after they have reverted to the control of their proper battalion commanders.

b. Command.—The commander of the group is preferably the appropriate regimental machine-gun officer. If the group is acting under division orders, the division machine-gun officer coordinates the tasks of the guns of the group. The command of the companies forming the group is exercised by their proper company commanders. Companies are not split up and assigned to such missions that units of the company will be removed from command of their proper company commander.

Grouping by division or brigade is adopted for the purpose of coordinating the fire of the machine guns so as to serve the interest of the unit as a whole. Physical grouping is usually not necessary. Whenever possible, machine-gun companies are assigned positions and missions which will make them most readily available for service with their battalions.

c. Missions.—The missions of the groups will usually be to cover the deployment of the regiment, brigade, or division and to support the attack in its initial stages. The group commander may organize from the companies a number of barrage units, but in making such an organization tactical units are to be preserved. The group commander assigns positions and missions to the companies. The company commanders arrange for the execution of the details.

d. Fire.—The fire of the companies composing the group is directed, coordinated, and controlled by the group commander, and the fire of the group is coordinated with the fire of the machine-gun companies of the assault battalions and with the weapons of the howitzer company and the artillery.

The group may employ direct or indirect laying, but direct laying is employed whenever the situation permits. When indirect laying is employed, directions for its delivery are usually prescribed in a time schedule pepared by the group commander.

e. Communication.—Communication within the group is maintained by runners, telephones, or prearranged signals. Communication between the group and the command which it is supporting may be by any of the above means, but is usually by means of rockets or telephones. The means of communication between the company and the group commander are those best suited to the situation. The group commander prescribes, and the company commander provides, the means of communication. The telephone and the prearranged pyrotechnic signals find more frequent use in the group than in the companies of the assault battalions.

f. Transportation.—The group is an improvised organization of machine guns and has no transportation of its own. When a company is withdrawn from a reserve battalion to become a part of a group, the combat train of the company goes with it unless the company can be supplied directly from its battalion. The group commander may designate a location for the trains, but the command of the company train is retained by the company commander unless special conditions make it necessary to combine the trains of the group. If the trains are combined the group commander releases the train of any company which leaves the group to join its battalion, and he is responsible that the train reaches the proper command in time to perform its required duties.

g. Supply.—The group has no independent means of supply. The companies forming the group maintain independent means of supply. Generally the companies will be supplied in the normal manner. Supply, except the supply of ammunition, will be regulated by the company commander through the second in command, who will obtain the necessary supplies through the battalion supply officer. Supply of ammunition is also regulated by the company commander. In this case requests are made to the battalion commander, who secures the required ammunition from the regimental munitions officer through the regimental C. P.

Since the group is formed for a special purpose, requirements can often be foreseen and needs can be provided for in advance.

h. Returning to battalions.—The order forming the group states at what time the companies will revert to the command of the infantry battalion commanders from whose command they are withdrawn. But in any case, when a reserve battalion becomes an assault battalion, its machine-gun company is directed to join it. As soon as possible after the reserve battalion has received an active mission, steps are taken to insure that the machine-gun company, if not

present, will be returned to the battalion before the beginning of the mission. If the company is a part of a group, the battalion commander at once makes request to the proper authority for the return of the company. The company commander does not separate the company from the group until authorized by the group commander.

i. The order forming the group.—The order withdrawing machine-gun companies from reserve infantry battalions for the purpose of forming groups for special missions should state the following:

(1) Who the group commander will be.

(2) When the companies will come under the command of the group commander.

(3) Where the group will assemble.

(4) What missions the group will perform.

(5) Special provisions for supply, communication, etc.

(6) When command of the companies will revert to their proper infantry battalion commanders.

30. Executing special missions.—Situations occasionally arise in which a single machine-gun company is withdrawn from a reserve for the purpose of executing some special mission, such as to cover deployment, to fire preparatory fire, to meet a threatened counterattack, or to assist by fire an assault battalion which has been held up by enemy resistance. This will occur most frequently in the regiment, but may occur in the brigade.

An order from the regimental or brigade commander designates the company and the command under which it will act. It may come temporarily under the command of the assault battalion commander or the regimental machine-gun officer or act directly under the regimental commander. The designated commander assigns to the company a position and a mission. The company commander is responsible for the details of the execution of the mission.

When the mission is accomplished, the command of the company reverts to the commander of the battalion to which the company belongs. This is usually specified in the order designating the company to perform the special mission, but in case it is not so specified, the commander concerned returns the company to the proper reserve battalion commander as soon as the special mission is completed.

31. In reserve.—When the battalion is in reserve and the machine-gun company is not withdrawn from the battalion, the company commander keeps the company always ready to assume an active rôle without delay. The men and animals are kept as fresh as possible, the equipment is kept in good condition, and the company is kept well supplied.

32. Attack against woods.—Machine guns have little offensive value in woods. For that reason, machine-gun action in woods is avoided, except where there are features, such as large clearings or roads, which permit of effective application of machine-gun fire.

In moving forward, woods may be taken advantage of to gain cover from aerial observation. Woods which are heavily shelled or contain gas concentrations are avoided if possible.

In attacking an enemy holding woods, frontal fire is employed against the edge of the woods to support the attack. Frontal fire penetrates the woods to a considerable depth and has both a moral and a physical effect on the enemy within the woods. Enfilade fire along the edge of the woods is soon stopped by the trees and has very little moral or physical effect on the enemy, but such fire is valuable in preventing the enemy from debouching from the woods. If the assault echelon passes around the woods, enfilade fire on the flank of the woods and frontal fire on the front of the woods should be employed.

If the woods are small, the machine guns support the attack until friendly troops enter the near edge. The guns are then moved to a flank from which fire can be delivered on the enemy approaching or leaving the far edge and from which support can be given to the exit of friendly troops. If the woods are large and can not be avoided, the machine guns support the entry into the woods and then close up on the assault echelon as close as the situation permits. The position of the guns should be such as will permit ready use within the woods in case an opportunity is presented, and such that they will arrive early at the far edge of the woods. As soon as possible after arriving at the far edge of the woods the guns take up positions from which they can cover the reorganization of the rifle companies. Positions are selected which permit support to be given to the advance from the woods.

33. Attack against villages.—Villages are usually entered in attack from a flank or from the rear. Walls, hedges, and houses lend themselves readily to defensive preparations which render the success of the frontal attack very costly. Machine-gun fire is concentrated on the front and the flanks of the village to neutralize or immobilize the enemy at these points while the rifle companies maneuver to attack from a flank or the rear. The machine-gun positions selected are such as will permit fire to be delivered against the village until friendly riflemen have entered it.

As soon as friendly troops have entered the village some of the guns are moved to positions from which they can fire on the enemy leaving or approaching the village.

Throughout the attack a careful study of the village is made with field glasses in order to discover the location of the enemy machine guns and auxiliary defenses.

Section III.—IN ADVANCE GUARD

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34. General.—*a. Principles governing employment.*—The principles governing the employment of machine guns with an advance guard are the same as those governing their use in attack or in defense, depending on whether the mission of the advance guard is temporarily offensive or defensive.

b. Missions.—The missions of the machine guns of an advance guard may be—

(1) To force a premature deployment of the enemy forces.

(2) To delay the enemy.

(3) To gain a temporary advantage in order to permit movement of friendly troops or prevent movement of the enemy.

(4) To hold high ground, good defensive positions, bridges, defiles, or other features of the terrain essential to the success of the main body or the advance guard.

35. Conditions governing use.—*a.* The nature of the missions of an advance guard is such as requires the development of a large volume of fire in a short space of time. Machine guns are well suited to such a mission.

b. Machine gunners can not advance their guns by hand and keep up with a marching command for any considerable length of time and for that reason machine guns with an advance guard while marching are carried on their carts. Machine guns are assigned only to those advance guards which are of sufficient strength to promise reasonable safety to the guns while on the road in draft. Practically, the measure of this strength may be taken as the depth of the advance guard. The depth should be such that the guns can be so placed in the column that they will not come under effective small-arms fire while still on the carts.

c. A position in the column from 700 to 900 yards from the point will generally afford reasonable security to the machine guns. If caught under effective small-arms fire while in draft, the guns will be lost, immobilized or forced to accept serious casualties in effecting a flank movement under fire.

d. The rifle company is the smallest unit which will have sufficient depth when acting as an advance guard to warrant machine guns being assigned to it.

36. Apportionment.—A battalion acting as an advance guard will have its machine-gun company with it. If the situation and terrain are particularly favorable for the employment of machine-gun fire, additional machine guns may be assigned to the advance guard battalion.

The nature of the terrain and the character of the resistance expected are the factors which determine the number of machine guns assigned to an advance guard. Where the country affords good opportunities for flanking and overhead fire, the number of guns may be large. Where the nature of the terrain is unfavorable for machine-gun fire, fewer guns are assigned.

37. Position in formation.—*a. In an advance guard of one infantry battalion.*—When the advance guard consists of one battalion, the machine-gun company will, as a rule, form a part of the reserve. This assignment keeps the company intact and promotes ease of control and efficiency of action.

The position of the company is usually at the tail of the reserve. This position of the company has the following advantages:

(1) Renders more comfortable the march of the rifle companies, since the dust raised by the mules and carts will be at the tail of the column.

(2) Gives greater security to the machine guns in transit.

(3) Gives greater latitude in the selection of firing positions.

(4) Makes safer and easier the approach of firing positions.

If the company marches at the head of the reserve, the only advantage gained is that the time required for going into action may be slightly decreased. If the demand for immediate use of the guns outweighs the possibility of their loss or immobilization, then the company marches at the head of the reserve, or one platoon is assigned to the support and the remainder of the company to the reserve. Generally the risk and the sacrifice of position are not worth the advantages in time and effect gained by this disposition.

b. In an advance guard of two or more infantry battalions.—When the advance guard consists of two or more battalions, there should be at least one machine-gun company in the support and one or more companies in the reserve.

The machine guns with the support march at the tail of the support. The position of the guns with the reserve depends on the probability of their early action and the comfort of the marching riflemen.

38. Command.—The command of the machine-gun units of an advance guard rests with the commander of the subdivision, if attached directly to a subdivision, otherwise with the advance guard commander.

39. Reconnaissance.—*a. On the march.*—Reconnaissance for the machine-gun units of an advance guard is continuous. The machine-gun unit commander accompanies the advance guard or subdivision commander on the march. The map is frequently studied and the terrain constantly observed in an effort to learn as much as possible of the probable positions and activities of the enemy and of friendly troops. All positions are noted from which the guns could go into action in case resistance is developed from any quarter. Possible enemy activities are anticipated and tentative plans of action decided on to meet any contingencies.

b. When resistance is encountered.—When resistance is encountered, the guns are put into action as soon as a use for them is developed. There is usually no time for an extended reconnaissance. The machine-gun company commander uses the reconnaissance officer and the reconnaissance petty officer to assist him in discovering the situation, selecting positions, and determining ranges.

40. Selection and occupation of positions.—*a. Satisfactory positions.*—Decisions should be prompt and action definite. It is essential that no time be lost in getting the guns into action or in seeking ideal positions. Any position from which effective fire can be delivered on the enemy is accepted as satisfactory.

b. Arrangements for occupying positions.—As soon as a mission has been assigned to the machine-gun company the company commander decides on the manner of its execution and takes immediate steps to bring the guns into action. Targets and positions are decided on, routes of approach to the positions are selected, and locations for the carts and headquarters are found while the company is being brought up.

c. Bringing up the company.—The company commander may return to the company and lead it up into position or he may send back a runner, petty officer, or officer to conduct the company to some designated point. The point designated is close behind the probable positions for the company and offers cover from view or cover from fire, or both. The company is brought up to this point and held in readiness while the company commander issues his orders. If no cover is available behind the probable position it is better to complete the selection of the positions for the guns before the company is brought forward.

41. The company in action.—From the time of issuing the orders to the conclusion of the action the principles governing the use of the company are the same as those previously enunciated for the attack or those which will subsequently be enunciated for the defense.

Section IV.—IN DEFENSE

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42. General.—*a. Requirements of defensive organization.*—Defensive tactics are essentially the tactics of holding extensive fronts with relatively weak forces. The defense must act by surprise; it must be mobile, aggressive, and flexible; it must preserve tactical unity; and it must have the tactical principles of open warfare as a basis of organization for its units.

b. Value of machine guns.—In no phase of combat do machine guns find greater opportunity for demonstrating their strength than in the defense. By the power of their fire they give rigidity to particular points in the framework of the defensive organization, and by their ability to fight in any direction they give elasticity to the whole structure. They are distributed throughout the width and depth of the defensive zone and should be able to exert a continuous influence on the action from the time the enemy initiates an attack until friendly troops have delivered a counterattack and driven the enemy back to the shelter of his own defenses.

c. Principles governing use of machine guns.—The principles governing the use and disposition of machine guns in defense are the same regardless of the purpose of the defense or the character of the defensive dispositions.

The actual location of the guns on the ground is, however, influenced by both the purpose and the character of the defensive organization.

The guns are disposed to make one continuous fight. This fight begins when the enemy shows his intention to attack; it increases in intensity until the enemy has reached the main line of resistance and has been rolled back by a counterattack; and it ends when the defeated enemy has disappeared within his own defensive works.

d. Classification of machine guns in defense.—For convenience of discussion in these regulations the machine guns of a defensive system are classified according to their missions as—

(1) *First-defense guns.*—These are guns sited to fire on the enemy as he approaches and assaults the line of resistance of any position. When an outpost position is organized, as in the zone defense, it, too, will have first-defense guns sited to fire on the enemy throughout his advance to the outpost line of resistance.

(2) *Break-through guns.*—These are guns sited to fire on the enemy as he progresses through the defenses of a position in order to disorganize his attack, limit penetrations, or check envelopments.

(3) *Reserve guns.*—These are guns held out of the fight until the direction and force of the enemy attacks can be determined so that they can take part most effectively in maintaining the battle position and in supporting counterattacks. These guns usually belong to units whose positions are so far to the rear in the defense system that they can not be employed in the earlier stages of the enemy attack.

43. Command.—In the defense, rifle battalion commanders organize centers of resistance and are held responsible for the defense of a certain definitely specified part of the front. The battalion commanders retain command of their

respective machine-gun companies and exercise this command through the machine-gun company commanders.

Guns sited in accordance with the regimental, brigade, or division plan of defense are moved only on orders from such proper headquarters. However, exception is made should the battalion commander find it necessary for the fulfillment of the mission of the higher command to move such guns. In this event he will promptly report the necessity and action to the higher headquarters as soon as practicable.

Machine-gun companies of reserve battalions may be withdrawn from their battalions and used for special purposes. In such cases the company commander operates under the orders of an officer especially detailed for the purpose.

44. Coordination of machine-gun defenses.—*a. Necessity for coordination.*—The fire of all of the machine guns of a defensive organization must be coordinated. It is only by this coordination that the maximum power of the machine guns can be developed and the greatest advantage gained from their use.

b. In a deployed defensive.—In a defensive imposed by the failure of an offensive effort or assumed in the face of resistance, coordination of machine-gun fire is begun at once by the battalion commander, through the machine-gun company commander, and as time permits is expanded and perfected through the higher units. The fire of each machine-gun platoon is directed to protect the front and flanks of the rifle company it may be supporting and then coordinated with the fire of neighboring platoons. The fire of the company as a whole is directed so as to best protect the front and flanks of the battalion and then coordinated with the fire of neighboring companies. The regimental commander, through the regimental machine-gun officer, coordinates the machine-gun defenses of the regimental subsector and secures coordination with neighboring regiments. Finally the division commander, through the division machine-gun officer, coordinates the machine-gun defenses of the division sector and secures coordination with neighboring divisions.

c. In a hasty defensive.—In a defensive hastily assumed, the plan of coordination begins within the battalion and will be expanded as outlined above as soon as practicable.

d. In a deliberate defensive.—In a defensive deliberately assumed, the coordination of the machine-gun defenses throughout the division is directed by the division commander, through the division machine-gun and howitzer officer, and is planned as far as practicable before the defensive positions are prepared or occupied.

45. Coordination of machine-gun defenses with other elements of the defensive organization.—Neither the number of available machine guns nor the nature of the terrain permits the entire defensive area to be covered by machine-gun fire. The dead spaces in the lines of machine-gun fire are covered by the fire of combat groups, by the fire of the light mortars, or by the fire of the artillery.

The machine-gun company commander locates the spaces in the battalion area which can not be covered by the fire of the machine guns. He makes a report to the battalion commander of these dead spaces in the line of machine-gun fire as soon as practicable after the battalion has occupied or been assigned to a defensive position, and he should be prepared to make proper recommendations as to the best means of covering these dead spaces. The battalion commander coordinates the fire of all the weapons of the battalion and makes request to proper headquarters for artillery fire when that is necessary.

46. Reconnaissance.—*a. Before occupation of positions.*—The reconnaissance which is made prior to the occupation of positions should be as thorough as time and the situation permit.

When the attack is halted by resistance there will have been no preliminary reconnaissance for the purpose of locating defensive positions. The guns at first defend the ground from the positions in which they find themselves while the machine-gun company commander makes his reconnaissance. The plan of defense of the machine-gun company commander is based on the tactical situation, the location of lines of resistance and advanced posts, and the condition of troops. This information can be obtained by the machine-gun company commander in general terms from battalion headquarters and from his own means of obtaining information. With these considerations in mind, he makes a map reconnaissance and decides on the general dispositions to be made of the guns of the company and the principal lines to be covered by their fire. This

map reconnaissance is then verified by a personal reconnaissance of the ground, and such changes made in the plan of defense as may be found necessary on account of the nature of the ground and the exact disposition of troops.

When the defensive is hastily assumed, the regimental machine-gun officer usually makes a map reconnaissance of the regimental subsector and decides on and recommends to the regimental commander a plan of machine-gun defense. Time will generally not permit the regimental machine-gun officer to supplement this map reconnaissance by a personal reconnaissance of the ground before the positions selected have been occupied. In such a case the plan is issued to the machine-gun company commanders from the map. If time permits, they make a personal reconnaissance and select the exact positions for the guns and the sectors and lines of fire. If time does not permit this action, the platoon leaders are assigned to positions from the map and the company commander makes his personal reconnaissance as soon thereafter as practicable.

When the defensive is deliberately assumed, the division machine-gun and howitzer officer makes a reconnaissance of the position, and prepares and submits for approval a plan for the employment of machine guns, based on the plan of defense. This plan for the employment of machine guns, after coordination and approval, is usually published as an annex to the division field orders.

b. After occupation of positions.—After positions have been occupied, reconnaissance is continued. The company commander keeps constantly in touch with the guns of his company and the situation. This action is accomplished through the reports of the platoon leaders, by personal reconnaissance of the positions by the company commander and the reconnaissance officer, by a study of air photographs and intelligence summaries, and by any other means available.

47. **Selection of positions.**—Positions are selected to cover the weak points in the defensive system and protect the front and flanks of the strong points. This requires that they be located to cover the intervals between strong points and at reentrant angles in the defensive lines. The guns of the company are disposed in depth. Control is greatly facilitated by disposing the sections of the platoon in depth, rather than by disposing the sections of the platoons laterally and the platoons of the company in depth. When the defensive is assumed from the offensive, the sections of the platoons are liable to be disposed laterally. The company commander causes the sections of the platoons to be disposed in depth as soon as positions can be selected for the guns and conditions permit the change to be made. As the defense becomes more stabilized, positions can be selected farther to the rear and the dispositions of the company can be perfected.

When the defensive is hastily assumed there is usually time for the hasty selection of positions giving depth to the defensive organization. The company commander, however, continues to study the battalion area with a view to improving the dispositions of the machine guns.

If the defensive is deliberately assumed, a proper disposition of the guns is ordered in the beginning by the division plan. The company commander in assigning the sections of the platoons to the positions which have been ordered considers the ease of control and supply and so assigns them that they will be disposed in depth where practicable.

In selecting positions for the company, care is exercised to avoid separating the guns so much that they can not be mutually supporting. This is a dispersion of force and renders the guns liable to be destroyed or captured by small forces of the enemy.

48. **Siting guns.**—*a. General considerations.*—Guns are sited to cover by fire, as far as practicable, the front and flanks of all of the elements of the defensive system and are themselves mutually supporting. They cover the ground over which the enemy is expected to attack, and they are so located that they will have targets best suited to the characteristics of machine-gun fire. All guns are sited primarily to employ direct laying, although breakthrough and reserve guns are usually given a mission requiring the employment of indirect laying.

b. First-defense guns.—Those guns which are sited to deliver fire on the enemy from the time he begins his attack until he reaches the outpost positions are sited so as to have wide fields of fire in and beyond the outpost area. They should, if the terrain permits, be able to cover the important approaches and the lanes in the wire and then place a belt of fire in front of the outpost position. Finally, they should be able to fire on the positions of combat groups

and strong points in case the enemy seizes them. These guns are not, as a rule, sited in advance of the outpost position. Should guns be sited in advance of the outpost position they are sited for all-around defense so as to permit concentration of fire on favorable targets and to lessen the danger of capture. Such siting, however, is exceptional.

The first-defense guns sited to break up assaults on the main line of resistance are so placed as to sweep the area in front of their own units and of adjacent units with interlocking bands of fire. Final protective lines are given to each gun. To some of these guns definite sectors may be assigned within which all favorable targets will be engaged, but all guns switch to their final protective lines as the enemy approaches the position covered by such lines. First-defense guns are sited for direct laying only. However, arrangements are made to execute their missions by indirect laying in case fog, smoke, or darkness renders direct laying impracticable.

c. Break-through guns.—Those guns which are sited to deliver fire by direct laying on the enemy, after he has reached a line of resistance and as he penetrates the defenses in rear of such line, are so located that they can command the probable routes of advance of the enemy and cover the withdrawal of friendly troops. They may be sited to fire on a single important line but generally they are given wide sectors of fire. If the guns are sited in isolated positions, they are so located as to be capable of all-around defense in order to resist an attack from any direction. Too wide a sector of fire leads to dispersion; 1,600 mils is as much as a section can ordinarily cover satisfactorily.

Break-through guns are sited primarily to employ direct laying but may also be given an indirect laying or antiaircraft fire mission. Arrangements are made to execute the direct laying mission by indirect means in event such a course becomes necessary.

Break-through guns are sited throughout the depth of the defensive system back to the battle position inclusive. They are located at advantageous points from which they can best delay and disorganize the enemy's attack and limit penetration of organized positions. The bulk of these guns is, however, sited for the defense of the battle position.

d. Reserve guns.—Positions for the reserve guns are selected so that they can enter in the fight at the main line of resistance and support the counterattack. Since the direction and force of the enemy penetrations can not be foreseen, it may be necessary to select more than one set of positions for the reserve guns.

49. Preparation of positions.—*a. General considerations.*—As soon as positions have been selected for the guns in defense, they are prepared for occupation. The degree of preparation depends on the time and matériel available, the length of time the positions are occupied, and the fire and observation of the enemy. Preparation for the most part is done at night and all signs of the work carefully concealed. During the first stages of the preparation the guns may be sited in other positions which have been only hastily constructed. Emplacements are made large enough to accommodate the gun, two men, and necessary ammunition, water, oil, and spare parts. Hasty emplacements for the gun and shallow cover for the men are dug at first. These are improved as time permits until there are elaborate emplacements with overhead cover for the gun and the men, with a communication trench between them. The division combat engineer regiment is prepared to furnish material and technical assistance in the construction of these more elaborate emplacements, and of cut-and-cover or cave shelters for the personnel.

In preparing the positions, it is essential in the beginning that there be concealment both aerial and terrestrial. The next consideration is to gain cover from fire. Certain camouflage material and assistance in its erection may be obtained from the engineers.

b. Alternate emplacements.—Alternate emplacements are selected and prepared in much the same manner as the permanent emplacements. The emplacements are so selected that the guns can occupy them, if the permanent emplacements become untenable, and still perform their missions.

c. Dummy emplacements.—Dummy emplacements are constructed and the work partially concealed. The purpose of these emplacements is to mislead the enemy as to the location of the permanent emplacements. They are usually located at least 100 yards to the flank and 200 yards in front or in rear of the permanent emplacements so that the fire which they draw will not hit the permanent emplacements. They must, however, be maintained so as to give the appearance of being used.

d. Positions for reserve guns.—Positions are selected and prepared for the reserve guns, but since these positions are occupied only during an attack or an alert the preparation is not so elaborate as in the case of the positions which are constantly occupied.

e. Range cards.—The company commander sees that there is prepared for and posted in each emplacement a range card. This card will show such data necessary to enable the gunner to fire on the principal targets offered in his sector of fire. A copy of the range card of each emplacement posted so as to show current data is furnished to the company commander.

f. Company commander's map.—From the information contained on the range cards and from his orders and inspections, the company commander prepares a sketch or marked map on which is shown—

(1) The location of each gun of the company.
(2) The sector of each gun of the company.
(3) The principal targets in the sector of each gun.
(4) The S O S (normal barrage) line of each gun.
(5) The final protective line of each gun in the case of first-defense guns.

A copy of this map is furnished to the battalion commander.

This map is kept up to date and all changes which may be made in the dispositions of the guns or the lines of their fire are entered on it and reported to the battalion commander.

50. Reports.—*a. Platoon leaders to company commanders.*—In a deployed defensive or in a hastily assumed defensive when the section leaders are required to site the guns of their own sections, as soon as their positions are selected, the platoon leaders make sketches of their positions and send them to the company commander.

These sketches show the location of the guns, the location of combat groups, the sectors of fire, the principal lines of fire, and the principal targets.

b. Company commander to battalion commander.—As soon as the company commander can determine definitely the location of the guns of the company with their sectors of fire, principal lines of fire, and principal targets he embodies this information on a sketch or marked map and delivers it to the battalion commander. He reports at the same time the location of any dead spaces in the line of machine-gun fire and recommends that these dead spaces be covered by appropriate means. The permanent location of the guns depends on the approval of the battalion commander of the plan of his machine-gun company commander.

After guns have been located and their locations approved by the battalion commander they are not moved, except to alternate positions, without the approval of the battalion commander, except in case of emergency. In such a case the company commander reports the change and the reason to the battalion commander at the earliest practicable moment.

51. Control.—The platoon is the basis of control. In siting the guns of the company in defense, the company commander can best insure control by properly assigning positions to the sections of the platoon. Disposition of the sections of the platoons in depth greatly facilitates control. Platoons are disposed laterally only when the sections can be so closely placed that control is easier than if they were disposed in depth.

52. Communication.—Communication is maintained between the machine-gun company commander and the elements of the company, and between company headquarters and the battalion headquarters, usually by means of runners.

53. Supply.—*a. General considerations.*—The company commander is responsible for the supply of food, ammunition, water, oil, and other necessities to the men and guns of his company. He keeps himself informed of the needs of the company and makes provision sufficiently in advance to insure that all requirements are fulfilled.

The supplies are procured and distributed by the rear echelon of the company in accordance with the orders of the company commander. Supplies are usually sent up to the companies in position at night. The carts bring the supplies up to a designated point, from which they are delivered to the troops by carrying parties. If the platoons of the company are widely separated, it may be necessary to designate a distributing point for each platoon.

b. Ammunition.—In a stabilized position or before a defensive battle the amount of ammunition normally at the guns is increased. The supply at the company or platoon distributing points is increased by 10,000 rounds per gun.

At least half of that amount is in belts ready to be fired. Guns in the rear positions keep at least 10,000 rounds loaded in belts at each emplacement.

c. Water and oil.—When action is expected, an ample supply of water and oil is secured and placed at each position.

54. **Transportation.**—The combat wagons pertaining to the company trains are handled in defense by the regimental munitions officer. This transportation is used to transport ammunition from the regimental munitions distributing point to the battalion munitions distributing point. The ration and baggage wagons, the rolling kitchen, the water cart, and the ration cart operate under the direction of the battalion supply officer and are under the immediate command of the second in command of the company. They are with the rear echelon of the battalion. The battalion commander usually designates the location for the company kitchen. If the company commander is allowed any latitude in the choice of position for the kitchen, he chooses a position as close to the company as the situation permits.

The carts are with the rear echelon of the company. They are under the orders of the second in command and are used to transport munitions and supplies up to the distributing point designated by the company commander.

55. **Routine.**—The routine for troops garrisoning a defensive position is prescribed in general orders. These general orders cover such points as alarms, alerts, guards, reliefs, discipline, and general sanitation and police. The company commander is responsible that these general orders are strictly complied with. In addition he issues such special orders as may be necessary to insure that the company will always be prepared to meet any situation which may develop. These special orders provide for adequate sentries at the guns, proper orders for the guns, special alarms, arrangements for care of equipment, procurement of supplies, execution of necessary work, evacuation of sick and wounded, and replacement of casualties.

56. **Inspections of the company.**—The company commander inspects the company at least once every 24 hours. This inspection includes a visit to each emplacement. At his inspection the company commander sees that all general and special orders are being complied with, that there is posted in each emplacement a proper range card and the special orders for the sentry at that emplacement, and that the sentries thoroughly understand their orders.

57. **Action before an attack.**—The activities of the enemy usually indicate his intentions to attack. These activities may be learned from intelligence reports or from the visible actions of the enemy, such as raids and shelling. When the company commander learns of indications of an enemy attack he at once takes all practicable steps to have the company in readiness to receive it. Troops are warned and such special instructions as the situation requires are issued and supplies of ammunition, water, oil, and rations are provided for.

58. **Action during an attack.**—After the attack has been delivered, the company commander keeps as well informed of the situation as possible and is prepared to make any changes or take any action the battalion commander may order. He arranges for the supply of the guns in position and conducts the withdrawal of the company in case a withdrawal is ordered. After the attack has commenced the control of the company becomes more difficult. Proper plans and preparations having been made in advance, greater dependence must be placed on the platoon and section leaders for the control of the guns during the fight.

59. **Action against tanks.**—It may be assumed that tanks are proof against machine-gun fire (30 cal.). The only defense against them is artillery or special antitank weapons. When an attack is supported by tanks, the machine guns do not fire at them but at the walking tank guides and the infantry which accompany or follow the tanks. If no infantry is seen, the machine guns remain silent. Scouts preceding the tanks are not fired on unless rifle fire fails to stop them.

If the tanks pass the machine-gun positions, the gun continues to fire on the riflemen, and especially on those riflemen on the flanks or in rear of the machine-gun positions. If a tank advances against a gun, it is lowered into its shelter when the tank is about 100 yards away. The chief concern of the gunner should be to save his gun from being crushed by the tank, so that he can use it against the hostile riflemen.

When the hostile attack halts to execute a passage of lines, the accompanying tanks will keep in motion to avoid artillery fire. The machine gunners take this movement of the tanks as a warning of a further advance and take

advantage of the opportunity to range in on the enemy position and prepare to meet the attack.

60. **Action against smoke.**—If, during the course of an enemy bombardment, he suddenly puts a smoke screen across his front, it may be assumed that he is forming an attack under cover of the smoke. An increase of hostile machine-gun fire at this time is an additional indication that the enemy intends to attack. First-defense guns fire at the smoke screen. If a barrage is called for, guns in rear also fire when the enemy light artillery forms a standing barrage. Its first lift is taken as a command for all guns to fire on their final protective lines.

65. **Reliefs.**—*a. Reconnaissance.*—In carrying out a relief in an occupied sector, the machine-gun company commander makes a personal reconnaissance of the sector his company is to defend. When practicable, this reconnaissance is made one or two days before the relief is effected. The platoon leaders and the reconnaissance officer usually accompany the company commander on the reconnaissance. Generally the reconnaissance starts at the headquarters of the infantry battalion which is to be relieved. The battalion commander and the commander of the machine-gun company to be relieved explain to the machine-gun company commander who is to make the relief the general plan of defense and the general dispositions of the rifle units and of the machine guns.

In taking over a sector which has been occupied for some time it is generally best to take over the positions which are already occupied rather than to make any immediate changes. The emplacements contain range cards, trench orders, and other valuable information which would not be available if new positions are taken up. If the dispositions taken over can be improved upon, the improvements are made after the positions have been occupied.

The company commander of the company to be relieved, or an officer detailed by him, conducts the reconnaissance party over the sector. If practicable, the company commander who is to make the relief goes over the entire sector. The platoon leaders meet the platoon leaders whom they will relieve and discuss in detail the positions which their platoons will occupy.

b. Points to be determined.—The reconnaissance determines the following points:

(1) The general location of the enemy lines and of friendly lines.

(2) The organization of the position, the location of the machine guns with respect to the rifle groups.

(3) The location and missions of the machine guns in detail.

(4) The location of guns of units on right, left, and in rear.

(5) The location of various headquarters.

(6) The details of communication, such as routes, message centers, telephone lines, signals, etc.

(7) The capacity and the condition of dugouts and shelters.

(8) The condition and quantity of equipment at gun positions. The amount and condition of ammunition and water. What is trench equipment and what will be taken away by the unit being relieved?

(9) The location of distributing points.

(10) The location of kitchens and the method of bringing up and distributing water and rations.

(11) The cover for the carts and animals.

(12) The activities and habits of the enemy with reference to shelling, harassing, and raiding.

(13) The reports required by higher headquarters. When and how submitted.

(14) The works and improvements contemplated or in process of construction.

(15) The details of the relief: (*a*) Hour. (*b*) Routes. (*c*) Point where equipment will be removed from the carts. (*d*) Password or countersign.

c. Effecting the relief.—After all arrangements have been made for the relief, the company commander gives the final instructions to the platoon leaders. The relief is generally made at night and if there is any danger of enemy observation it is scheduled for such time that the entire movement can be made under cover of darkness. Arrangements are made to insure that there will be no confusion between outgoing and incoming units.

The unit being relieved usually leaves one man at each gun position who remains there until the next night. This man assists the newly arrived troops by explaining orders, range cards, local conditions, habits of the enemy, and anything else which may be of value to them.

If practicable, the machine-gun company and the rifle companies composing an infantry battalion should not be relieved on the same day. There should usually be one day intervening, the machine-gun company being relieved last. This will insure that there is a machine-gun company familiar with local conditions and the requirements of the situation in position to cover the relief of the rifle companies.

66. Defense of special features.—The defense of special features of the terrain is discussed in detail in TR 420–130.

67. Machine-gun defense of outpost battalion.—First-line battalions in a defensive position may be required to provide for their own local security or the outpost for the entire front may be provided by infantry battalions especially designated for that duty. The method of garrisoning the outpost will be prescribed in orders from higher authority.

When a battalion forms the outpost it uses its machine-gun company as the situation demands. The machine guns are disposed by the machine-gun company commander in accordance with the battalion plan of defense.

If a smoke screen is put down in front of the enemy positions without any artillery preparation, it should not necessarily be taken as an indication that the enemy intends to attack. Smoke screens are often used to locate hostile machine guns by drawing their fire or to conceal reliefs and the arrival of tanks or other movements. In such case the machine guns do not open fire without an order, but stand at the alert.

61. Action against gas.—*a. General consideration.*—Machine-gun companies will usually not be close enough to the front to subject them to gas-projector attacks. Units of the company located within 1,000 yards of the enemy front line must always be prepared to meet a gas attack. The usual form of gas attack is by the use of gas shells. The best defense against gas is a strict discipline and thorough training in the use and adjustment of the gas mask.

b. Precautions against gas.—In a defensive organization the following precautions are taken to minimize the effect of gas:

(1) In selecting positions avoid low ground whenever practicable.

(2) Make permanent shelters gas proof.

(3) Supply antigas matériel to all permanent emplacements. Rubber boots, oil-skin clothing, gloves, and lime should be supplied in order to enable the gun crews to withstand persistent gases as long as possible.

(4) Special gas sentries are detailed to remain on guard at the entrance to all dugouts and shelters.

c. During the attack.—When the alarm is given that gas shells are falling in the vicinity or to the windward, masks are adjusted and all gas curtains dropped.

Guns in the outpost position are manned and all preparations made to meet an attack. If the gas attack is heavy and prolonged, the guns in the outpost position open fire at a slow rate on their lines of fire.

Guns in rear of the outpost position are alerted but are not mounted unless an attack appears to be imminent.

Bombardments with smoke shells are always treated as a gas attack. A gas-cloud attack is treated as a signal that the enemy will attack. A gas-shell attack of nonpersistent gases may be followed by an attack and is taken as an alert signal. A gas-shell attack of persistent gases will usually not be followed by an attack.

62. Action against aircraft.—The greater portion of the guns in rear positions, not under observation from the ground, are prepared to fire on hostile aircraft. The number of guns assigned this mission depends on the probable enemy aerial activity, the other missions of the guns, and the quantity and kind of other available antiaircraft defenses. Antiaircraft firing is not done from the permanent emplacements. Specific instructions are given to the gunners assigned to an antiaircraft mission to prevent them from wasting ammunition on airplanes not within range of their guns and from exposing themselves and the position of the guns. They are instructed to fire only on enemy planes within effective machine-gun range. If the plane is beyond range or in a position at which it can not be engaged, the gunners remain motionless until the plane has passed and there is no longer danger of their movements disclosing the location of the position.

63. Action during counterattack.—When the enemy penetrates the defenses, local counterattacks will be made in an effort to eject him. These counterattacks are supported by the fire of such machine guns as are available for the purpose. Generally, flanking fire can be delivered on the enemy from the positions already occupied by the machine guns. If this is not practicable, an

effort must be made to select positions which will permit the guns to deliver overhead flanking fire on the enemy.

64. **Harassing fire.**—During the defense, break-through guns may be withdrawn temporarily from their permanent emplacements and regular missions and organized into batteries for the purpose of firing harassing fire. This fire is for the purpose of harassing sensitive points within the enemy lines and thereby reducing his morale. Enemy kitchens, distributing points, roads, and headquarters are favorable targets for harassing. When the guns have executed their missions they return to their permanent emplacements.

Data for executing harassing fire are usually computed from the map and the fire is regulated by the indirect method. This class of fire is generally delivered at night, but may be delivered during the day. When delivered during the day harassing fire may be regulated by observation. One observation post may control several batteries. If practicable, telephone lines are installed. Permission may be obtained to use an artillery O. P. or to tap artillery wires for this purpose. The fire of the machine guns is coordinated with the fire of the artillery and the other weapons of the battalion.

Targets are engaged by the fire of more than one battery. The batteries engaging the target should be separated so that the cones of fire will interlace. This increases the probability of making hits and decreases the probability of betraying the battery positions.

Harassing fire may employ either direct or indirect laying. Concealment and defilade are the deciding factors. Positions for harassing batteries are from 500 to 1,500 yards behind the outpost position. When firing is done at night precaution is taken to conceal the flash of the gun.

On account of the wide front held in the outpost position by a battalion, the defense consists of a series of strong points organized in both width and depth and separated by large intervals. The task of the machine guns in the outpost position is to protect the front and flanks of these strong points and, in so far as possible, cover the intervals between them. The intervals between the sections are usually very wide and control of the sections by the platoon commanders or by the company commander will be extremely difficult. For that reason the company commander draws up a comprehensive and elastic plan of action for the company and depends on the section leaders to take the proper action in any situation which may develop.

All guns are sited to fire on the principal lines of approach so as to delay and develop the enemy as soon as possible after he begins an attack. The guns are so located that they can cover the withdrawal of the more advanced rifle groups and so that they can protect the front and flanks of the strong points in the outpost position. Whenever possible these guns are sited for all-around defense in order to enable them to concentrate their fire on favorable targets and to defend themselves against an attack from any direction.

The machine-gun company commander keeps himself informed of the plans and intentions of the battalion commander. He knows whether the guns are to be withdrawn in the face of an attack or whether they are to hold their ground and fight until destroyed or silenced, and he sees that the gunners are instructed accordingly. Guns in the outpost position never move to the rear unless to conform to the plan of defense or on the order of an officer competent to order such a move. When the plan of defense contemplates a withdrawal in the face of an attack, routes of withdrawal are reconnoitered and the section leaders instructed as to when and how they are to withdraw their sections.

If the machine guns are posted in isolated positions, rifle combat groups are provided to give local protection to the guns. If this can not be done, the machine guns are sited within the strong points or in such positions that they are protected by the strong points.

Section V.—IN OUTPOST

	Paragraph
General	68
Use of the company	69
Action during an attack	70

68. General.—*a. Principles governing use.*—The principles governing the employment of machine guns in outpost are the same as those governing their employment in defense. The discussion which follows applies particularly to the use of machine guns with the outpost of troops on the march or in bivouac. The use of machine guns with the outpost of a defensive system is covered in Section IV.

In accomplishing the mission of an outpost the fewest possible number of men are used. The characteristics of the machine gun make it a valuable weapon

for use with outposts for the purpose of covering roads, defiles, bridges, and other important avenues of approach.

A proper use of machine guns permits the employment of the fewest possible number of rifles. To that end additional machine-gun units may in many situations advantageously be attached to an outpost. The purpose of the machine guns is to increase the stopping power of the outpost. This purpose can be served effectively only when the machine guns are properly protected by the rifle units of the outpost.

b. Apportionment.—The number of guns to be assigned to an outpost depends on the size of the outpost, the character of the terrain, the intentions of the commander, and the nature of the situation with respect to the enemy. The battalion or outpost commander apportions the machine guns and assigns them to subdivisions of the outpost or battalion.

Usually the greater number of the machine guns are assigned to the supports and are placed on or near the line of resistance.

If the outpost line is thinly held, some guns are assigned to the reserve. If there are guns which are not needed elsewhere in the outpost system, they are assigned to the reserve.

Some guns may be assigned to important outguards, provided the value of their possible service in these positions outweighs the risk of their probable loss in case of attack.

Machine guns are not assigned to small outguards.

c. Missions.—The mission of machine guns with an outpost is usually—

(1) To cover by fire avenues of approach, such as roads, bridges, defiles, and favorable places to form for attack, and deny their use to the enemy.

(2) To command any neighboring ground from which the enemy would be able to view or to annoy the main body.

(3) During the day to delay, develop, and disorganize the enemy by long-range fire.

(4) At night to give close support to the elements of the outpost and protect them from being rushed and raided by the enemy.

(5) To protect the outpost from the fire and view of the low-flying enemy airplanes.

(6) To protect the front and flanks of the supports.

(7) To close the intervals between supports in case of attack, or, if the support line is not to be defended, to protect the weak points in the line of resistance.

d. Command.—The command of the machine guns of an outpost belongs to the battalion commander or outpost commander in case the outpost be smaller than a battalion. Commander of machine-gun units assigned to an element of the outpost is exercised by the commander of the element to which the machine guns are assigned.

e. Coordination.—The machine-gun defenses of the outpost are coordinated. When the outpost consists of one infantry battalion, the outpost commander is accompanied on reconnaissance by the machine-gun company commander. The machine-gun company commander acts as advisor to the outpost commander in matters pertaining to the use of machine guns. This relation between the outpost commander and the senior machine-gun officer is necessary, irrespective of the size of the outpost.

The machine-gun officer studies the situation and the terrain and keeps himself prepared to make prompt recommendations as to the best use to be made of the machine guns in case of an emergency.

On account of the distance separating the elements of the outpost, it may not always be possible to coordinate the fire of the machine guns of two neighboring elements. In such a case the plan of coordination should provide for the use of the guns of the reserve or of some post not threatened, for the purpose of closing this interval.

As soon as practicable after going into position, the machine-gun officer with an element of an outpost establishes communication with the machine-gun officer of neighboring elements and secures coordination where possible.

69. Use of the company.—*a. General.*—The use to be made of the machine-gun company in an outpost system depends on many things, such as the terrain, the situation, the proximity and probable intentions of the enemy, the size of the outpost, etc. The company is usually employed in one of the following ways: (1) In the line of supports. (2) In reserve. (3) Part in the line of supports and part in reserve.

b. In the line of supports.—When the company is used in the line of supports, sections or platoons are assigned to such supports as the situation requires,

and the command of the units of the company is transferred from the machine-gun company commander to the commanders of the supports to which the units are assigned.

The company commander is responsible that the units of the company, with all necessary equipment, join the proper supports in accordance with the plan of the outpost commander. The company commander visits each unit of the company assigned to a support and learns the situation, the mission and the dispositions of the support and the machine-gun unit, and gives the machine-gun unit commander such advice or assistance as the conditions permit. If the dispositions of the machine guns can be improved, the company commander explains to the support commander and the machine-gun unit commander the manner of improving the dispositions. If the support commander does not see fit to accept the recommendations of the machine-gun company commander and if the situation warrants it, a report of the case is made to the outpost commander.

The company commander informs himself of the exact location of all the units of the company and notifies each of these units of the exact location of company headquarters.

The company commander arranges for communication between the company headquarters and all the units of the company. This is usually done by mutual exchange of runners between company headquarters and each unit of the company assigned to a support. He also arranges for the supply and the administration of the elements of the company and designates a point of assembly for the company when the outpost is relieved.

Since the machine guns of the outpost may be called on to fire in smoke, fog, or darkness, it is necessary to compute data and make arrangements for carrying out the missions of the guns by employing indirect laying. The company commander inspects the fire data and the arrangements for employing indirect laying of the units of the company to see that the data are correct and the arrangements are complete.

c. In the reserve.—When the company is a part of the reserve the company commander makes a careful study of all available information and supplements this with a careful study of the map and the ground. All possible avenues of approach are considered, the probable actions of the enemy are anticipated, and proper steps are taken to meet an enemy effort coming from any direction. Positions are selected, data completed, and general instructions issued for the occupation of positions in case of an attack.

Since there are generally several possible directions from which the enemy may approach, it is usually necessary to decide on several tentative plans of action and to select a different set of positions for each plan.

The positions may be selected with a view to strengthening the line of resistance, to protecting a rallying point, or to closing avenues of approach.

The plans of action and the positions selected by the company commander should be those ordered by the outpost commander or should have the outpost commander's approval.

The company does not as a rule occupy any of the positions selected, but is held intact at a centrally located point from which it can be moved with the least delay to occupy the proper position when an attack develops.

d. A part in the line of supports and a part in the reserve.—When the number of guns is not adequate for proper protection of the entire line of supports or when the situation does not warrant using all available guns in the line of supports, some of the guns are assigned to the most important supports and the remainder of the company is held in reserve. The use of the guns in the line of supports and the duties of the company commander with respect to those units of the company are the same as previously described in subparagraph *b*. The use of the guns in the reserve and the duties of the company commander with respect to those units of the company are the same as previously described in subparagraph *c*.

70. Action during an attack.—The action of the machine guns during an attack on the outpost is the same as described for machine guns in defense.

The guns in the line of supports open fire on the enemy at long range to delay, develop, and disorganize him, and close to their final protective lines as the enemy advances.

The guns with the reserve are moved into positions as soon as the direction of the enemy attack has been developed or some point of the lines becomes threatened. They enter into the action according to the general plan previously decided on.

Section VI.—IN REAR GUARD

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71. General.—The purpose of the rear guard is to protect the main body against an attack from the rear. The rear guard checks hostile pursuit and permits the main body to avoid an engagement with the enemy. The mission of the rear guard is best accomplished by developing a large volume of aimed fire at medium and long ranges.

Machine guns form a very important part of a rear guard. Since the machine gun is not well adapted to defending itself against small parties of the enemy who may work around and snipe or rush the machine-gun positions, it is necessary for the rear guard to provide for the protection of the machine guns by assigning riflemen to that duty.

72. Missions.—The usual missions of machine guns with rear guards are—

a. To delay the enemy by forcing deployments at medium and long ranges.

b. To deny the enemy bridges, defiles, and other critical points in the route of advance which the enemy must follow.

c. To resist attacks.

d. To support counterattacks. (This is an exceptional use. Counterattacks are, as a rule, not delivered by a rear guard, except to extricate some part of the rear guard which has become too closely engaged with the enemy to break away or to regain possession of some critical point which, if held by the enemy, will endanger the main body.)

e. To cover the withdrawal of the infantry and the artillery of the rear guard.

73. Apportionment.—On account of the great value of machine guns in a rear-guard action, it may often be advisable to attach to the rear guard additional machine-gun units from the main body. The size and composition of the rear guard, the nature of the terrain, and the situation with respect to the enemy are the factors which determine the advisability of assigning additional machine-gun units to the rear guard.

The commander of the main body designates the troops to form the rear guard. The commander of the rear guard apportions the troops of the rear guard to the support and the reserve according to the requirements of the situation.

A rear guard consisting of one rifle company usually has a machine-gun platoon assigned to it, if the enemy is aggressive and the terrain is favorable for machine-gun action.

An infantry battalion acting as a rear guard or as a part of a rear guard always has its machine-gun company with it and may have additional machine guns attached to it.

74. Position in column.—The formation of the rear guard is similar to that of an advance guard reversed. The distances between the elements of the rear guard are approximately the same as the distances between corresponding elements of the advance guard and are governed by the same considerations.

In a rear-guard action there is little danger of a surprise which will permit the enemy to catch the machine guns in draft and immobilize or destroy them with small-arms fire. For that reason, in a rear guard consisting of one infantry battalion, a machine-gun platoon is usually assigned to the support if there is any probability of action. If there are two or more infantry battalions in the rear guard, there is always at least one machine-gun company in the support and one or more machine-gun companies in the reserve.

When the rear guard is marching on the road, the machine-gun units usually lead the elements of the rear guard to which they are assigned. Such a

formation gives protection to the machine guns, permits greater latitude in the selection of positions, facilitates the occupation of successive positions echeloned in depth, and enables the machine guns to cover the deployment of the rifle units in case of an attack.

75. Command.—The command of the machine guns of a rear guard rests with the commander of the subdivision, otherwise with the rear-guard commander. The commander of an element of the rear guard exercises command over the machine guns assigned to the element. Tactical decision rests with the rear-guard or subdivision commander. Decision as to the means and methods to be employed in executing a given mission rests with the machine-gun commander.

When riflemen are detailed as a special machine-gun escort, the command of these riflemen is exercised by the machine-gun section or platoon leader.

When there is only one machine-gun company in the rear guard, the machine-gun company commander commands the machine guns with the reserve. He always keep himself informed of the location and actions of the guns with the support. If the reserve becomes engaged, there is but one fight and the machine-gun company commander will then have to coordinate the action of all of the machine guns of the rear guard. If there are two or more machine-gun companies in the rear guard, the rear-guard commander coordinates the action of the machine guns in case the whole rear guard becomes engaged. The senior machine-gun officer or the regimental machine-gun officer, if present, may be consulted by the rear-guard commander in arriving at a plan for coordinating the action of the machine guns.

76. Reconnaissance.—*a. On the march.*—Reconnaissance for the machine-gun units of a rear guard is continuous. On the march the senior machine-gun officer accompanies the rear-guard commander and the commander of the machine-gun unit assigned to an element of the rear guard accompanies the commander of the element to which he is assigned.

The map is studied frequently and the terrain observed constantly in order to be ready to recommend and pursue the proper course of action in case of any exigency. The machine-gun unit commander observes all positions from which the guns could go into action in case the enemy attacked the rear guard from any quarter. The rear guard passes ground over which the enemy must advance. This peculiar condition in the rear-guard action gives to the machine-gun commanders a great advantage over the enemy and permits surprise effects to be gained which would be otherwise unobtainable. Possible enemy activities are anticipated and tentative plans of action decided on to meet any contingency.

b. During action.—When action becomes imminent, the rear-guard commander or subdivision commander decides on the method of defense to be adopted and the positions to be taken up. The machine-gun unit commander is usually consulted in arriving at a decision as to the employment of the machine guns. The machine guns are then assigned a mission and general positions.

The machine-gun commander reconnoiters these general locations and selects firing positions for the guns which will permit a satisfactory execution of the mission. If time permits, the machine-gun commander takes all or part of his officers with him and uses them in such a manner as will serve the best interests of the situation. When a hurried occupation of positions is imposed by the situation, the machine-gun company commander may give to the platoon or section leaders positions, missions, and fire instructions. In this case the platoon or section leaders make the detailed reconnaissance of their respective firing positions. As soon as positions are selected the machine-gun commander reconnoiters for routes of retirement and future firing positions. The company commander employs the reconnaissance officer and the reconnaissance petty officer for this purpose.

77. Selection of positions.—The selection of positions is governed by the general requirements for defensive positions. Certain points are, however, of special importance.

The positions are selected so that there will be depth to the defensive formation. Guns in rear cover the withdrawal of guns in front, and for that reason positions in rear are selected within supporting distance of those in front.

A field of fire as wide as possible is selected. Command should be sufficient to permit observation and fire at long and medium ranges. Dead spaces at close ranges are not of much importance unless the positions are to be held for a

considerable length of time. In such case the machine-gun commander recommends that those dead spaces be covered by combat groups or by some other means. Positions are so selected that they permit roads and important approaches to be covered.

Positions are selected on the flanks when available and practicable. From such positions the guns resist flanking movements of the enemy and can also cover the retirement of friendly troops.

Positions are selected which permit of easy withdrawal. The guns preferably retire under cover of the ground as soon as they move. This usually makes it necessary to select positions on topographical crests, on the sides of ravines, or in woods or other cover. Background is carefully considered and the guns are concealed in the least obvious places. Routes of withdrawal are defiladed from view and from rifle and machine-gun fire if possible. These routes are reconnoitered and are preferably along roads.

78. Occupation of positions.—Positions are seldom entered directly. Sections are marched to a flank and then conducted into the position from the rear. Concealment is of first importance. Cover from fire is usually obtained by siting the guns in folds of the ground, depressions, ditches, and cuts, or behind walls, ruins, or banks. If time permits, cover is improved by digging, and simple range cards are prepared. Fields of fire and ease of withdrawal are usually more important than cover from fire.

79. Ranges and fire.—All guns are sited to employ direct laying. Sections or platoons in rear may employ indirect laying also, if time and the situation permit. Such indirect laying mission is usually to fire on important approaches and areas defiladed from the guns in front. When indirect laying is employed the fire is regulated by observation.

Fire is not opened at ranges greater than 2,000 yards unless the enemy troops are in close formation and the ranges have been accurately determined or the strike can be observed. The enemy is not allowed to engage the rear guard so closely that the rear guard will be unable to extricate itself. Fire is usually opened at ranges from 800 to 1,500 yards. Occasionally opportunities may be obtained to ambush the enemy at close range. Ambushes render the enemy more cautious, and it is usually worth the sacrifice of a gun to obtain them. Opportunities to suprise the enemy in close formation at close ranges are taken advantage of. Fire is ordinarily frontal or slightly oblique. In order to obtain the maximum effect bursts are large—from 20 to 60 rounds.

80. Supply.—Since the rear guard has its source of supply preceding it, the problem of supplying the company is comparatively easy of solution, provided communication is maintained with the trains. Ammunition and supplies can be dumped at designated places, from which the company can secure them on its arrival there. Supply to the carts of the company is from the trains of the rear guard. Supply of ammunition, water, oil, and spare parts to the guns in action is by hand from the carts.

81. Communication.—It is essential that communication be maintained between the machine-gun company commander and the rear-guard commander, between the machine-guns company commander and all of the units of the company, and between the units of the company and the elements of the rear guard to which they are assigned.

Communication may be maintained by any means which are available and suited to the requirements of the situation. Generally the means employed are messengers or signals.

82. Withdrawal to subsequent positions.—The machine-gun company commander learns from the rear-guard commander when positions will be evacuated. The time of evacuation may be ordered by the rear-guard commander when the positions are first occupied or it may depend on the developments of the action. The company commander transmits this information to the platoons of the company. There may be difficulty and uncertainty in the transmission of orders to the rear guard in action. For that reason machine-gun unit commanders maintain communication with the nearest rifle units in order to ascertain what orders the rifle-unit commanders have received with reference to withdrawal. Machine guns protect the withdrawal of the infantry and artillery of the rear guard. No machine-gun unit will be withdrawn from its position before it has accomplished its mission without an order from the rear-guard commander or the commander of the element of the rear guard to which it belongs.

The whole of the rear guard never retires at the same time. Usually the retirement of the machine guns is made by sections. Occasionally it may be

made by platoons. The guns in the rear positions cover the withdrawal of the guns nearest the enemy. Positions in rear are chosen for the guns before they retire. The retirement of a section is covered by its rifle escort. The rifle support remains in position until the machine guns are loaded on the carts and started to the rear. It then follows the section as a patrol.

The machine-gun company commander and the reconnaissance officer select the new positions for the company when practicable. If this is not practicable, the new positions for the platoon are selected by the platoon petty officer while the platoon commander remains with the section engaged in firing. If available, firing positions are selected at least 800 to 1,200 yards in rear of the guns which remain in position to become the front guns. Some guns occupy the new positions in rear before all of the guns are withdrawn from the front positions. Troops retiring in contact with the enemy can not occupy successive positions unless the positions are already occupied by some friendly troops.

83. Use of carts.—The carts are used to carry the guns and the equipment in withdrawing to successive positions. To that end the carts are held in defiladed positions at or near the gun positions in order to have them immediately available for use as soon as the withdrawal is begun.

84. Supporting counterattacks.—If the rear guard delivers a counterattack, it is supported by the machine guns in the manner outlined for machine guns supporting a counterattack in defense.

85. Rifle escorts for machine guns.—Four to eight riflemen per gun are usually detailed as special rifle escorts for the machine guns of the rear guard. The rear-guard commander designates the rifle troops to form the machine-gun escorts. The machine-gun company commander assigns the escorts to the machine-gun units of the company. With interior sections, the rifle escorts are posted in such positions that they can protect the machine guns against small parties of the enemy and be readily controlled by the section leader. With flank sections the escorts are usually posted farther away and send out two men in observation.

86. Artillery escort.—Artillery in the rear guard usually provides for its own machine-gun defense by using the antiaircraft machine guns of the artillery batteries. Machine guns acting as artillery escorts are generally able to use their transportation for all moves.

The positions selected for these machine guns are usually forward and to the flank of the artillery position. If the artillery is sited behind a crest, the position of the machine guns is selected preferably on the crest and to a flank if there is a sufficient field of fire.

Section VII.—IN WITHDRAWAL

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87. General.—The principles governing the use of machine guns in rear guard govern their use in withdrawals. Retirements are made from defensive positions. Troops are moved successively and, if possible, all movements are made at night. Elements in front remain in position to cover the retirement of the elements in rear. In a successful tactical withdrawal, the machine guns may not have a great deal to do. In a forced withdrawal, the importance of the machine guns can hardly be overestimated.

88. Tactical withdrawal.—*a. Purpose.*—When the withdrawal is made for the purpose of securing some tactical advantage, such as falling back to straighten the general line or to occupy more suitable positions, arrangements may be more or less elaborate and deliberate. The object is to effect the withdrawal without interference by the enemy.

b. Machine-gun companies of reserve battalions.—The machine-gun companies of reserve battalions are withdrawn to assembly points and thereafter conducted as a part of their battalions. These machine-gun companies have no special duties to perform in the withdrawal.

c. Machine-gun companies in front-line battalions.—The front-line battalions cover the withdrawal of the troops in rear and are the last to retire. They start their withdrawal ordinarily by sending off the attached artillery, the howitzer company platoon, the battalion reserves, and the rear machine guns. After these elements of the battalion have effected their withdrawal the remaining machine guns are withdrawn.

During the first stages of the withdrawal the equipment of the machine-gun company is moved by hand. This renders the progess of the machine-gun com

pany slower than that of the rifle companies. For that reason the machine-gun units leave their positions before the rifle units are withdrawn. If practicable, the machine-gun units are assembled and marched on the roads.

d. Preliminary arrangements.—To insure an orderly withdrawal, the following preliminary arrangements are necessary:

(1) The routes, the order of withdrawal, and the destination or assembly point will be learned from the staff.

(2) The route will be reconnoitered.

(3) Two men from each section will be taken over the route, so that they can guide the section on its departure.

(4) The time and plan of withdrawal will be given to each officer and petty officer.

(5) Carts will be brought up as near as possible.

(6) All men will be instructed with reference to lights, noises, and secrecy.

89. Forced withdrawal.—*a. Requirements.*—When enemy pressure forces retirement, the immediate requirement of the situation is to place distance and a rear guard between the enemy and the retiring forces.

b. Machine-gun companies of reserve battalions.—If the situation permits, some reserve battalions may be withdrawn in the same manner as in the tactical withdrawal. The other reserve battalions are sent to occupy a covering position and protect the withdrawal of the front-line battalions. Covering positions are usually selected from 1,000 to 3,000 yards in rear of the front line, depending on the terrain, the distance of the retirement, and strength of the enemy pressure. The machine-gun companies of the covering forces precede the rifle companies into the covering position in order to get into action as soon as possible. A reconnaissance detail precedes the company and selects positions for the guns, so that there will be no delay or confusion in getting the company into position.

c. Machine-gun companies of front-line battalions.—Front-line battalions hold their ground to preserve the integrity of the front until the reserve battalions have occupied the covering position. They are then withdrawn. The machine guns are specially active at this time to insure that the front is held and to cover the withdrawal of the troops they are supporting. In covering the withdrawal to the covering position of the front-line troops the conduct of the supporting machine-gun companies is the same as in a rear-guard action.

d. Machine guns in the covering position.—The machine guns of the covering forces are disposed in depth and sited on natural strong points, such as in woods, in villages, or on high ground. The positions selected depend to some extent on the length of time the positions are to be occupied and the character of resistance to be offered. If the resistance is to be prolonged and stubborn, the positions are selected with great care and the most effective defense obtained which the situation permits. Positions are selected so that long-range fire can be delivered on all important approaches. All guns are sited to employ direct laying. Guns in rear may be given a mission requiring indirect laying also if conditions warrant it. Fire is opened at maximum effective ranges.

Unless ordered to do so by competent authority, the machine guns of the covering forces never abandon or surrender their positions.

They must delay the enemy and gain the time necessary to insure the escape of the main body.

Section VIII.—IN FLANK GUARD

Paragraph

General 90

90. General.—*a.* The principles governing the use of machine guns in a flank guard are the same as those governing their use in an advance guard or rear guard, depending on whether the main body is advancing or retiring. On account of the difficulty of maintaining contact with the main body, and at the same time executing the mission, the problem of the flank-guard commander is one requiring the greatest skill, initiative, and tactical ability.

b. Machine guns, by virtue of the power of their fire, are very valuable in a flank-guard action. The machine-gun company commander must exert the utmost effort in order to secure the greatest possible results from his guns. If the situation demands, he must willingly sacrifice guns and crews.

c. Shame and censure do not attach to gunners and companies that are captured in a determined effort to accomplish their mission, and only praise and glory attach to those who make the supreme sacrifice in order that their command shall not fail.

TRAINING REGULATIONS, No. 420–160

INFANTRY

Combat Principles—The Infantry Battalion

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Section I.—THE ASSAULT BATTALION IN ATTACK

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1. General.—The battalion is the attack unit whether operating alone or as part of a larger body. It generally attacks with one platoon attached from the howitzer company of the regiment. It may be reinforced by additional infantry weapons and accompanying guns.

2. Advance in route column, conditions.—The battalion advances in route column until the situation requires its development and deployment. This action should be so timed that the battalion does not enter the zone of hostile fire in close formation. Premature abandonment of the route march causes useless fatigue and is therefore to be avoided.

3. Reconnaissance in route march.—From the instant the battalion moves forward in its own zone of advance to the battle field, the battalion commander directs the necessary measures for reconnaissance and security. Reconnaissance is conducted to locate shelled areas, concealed and covered routes of advance, and to ascertain the progress of the adjacent units. Covering detachments are detailed to protect the front and flanks of the battalion during the advance and to develop the enemy position in the zone of action. When the battalion is acting alone and other transportation facilities are not available, the battalion commander must not hesitate to use the necessary mounts, motor cycles, and bicycles from his headquarters company for distant reconnaissance.

4. Covering detachments in route march.—*a.* The covering detachments deal with hostile patrols and advanced posts which have not been cleaned up by the covering detachments of the larger units (regiment, brigade, or division) or which have succeeded in passing through them. The battalion commander maintains close touch with his covering detachments by means of messengers. The strength of the detachments is increased when the front is not covered by detachments from the higher units.

b. In some cases, as in rapid pursuit, the advance may be covered by an advance-guard company which advances on a broad front and endeavors to hold the enemy in position by its fire while the other companies move forward and execute enveloping movements.

c. In the attack of an enemy in position, however, the duties of the covering detachments are limited to securing the march of the battalion and developing the enemy position. The battalion commander retains in his own hands the power of engaging his battalion according to a definite plan of action and does not allow the companies to become involved in a planless action initiated by the advance detachments.

5. **Position of battalion commander in route march.**—Throughout the advance into action the battalion commander is at the head or in advance of his leading company. Whenever the situation permits, he personally reconnoiters well in advance of his battalion. The march of the battalion is conducted by the second in command when the battalion commander is absent.

6. **March discipline.**—Rigid march discipline is maintained during the advance in route column. The battalion will often be required to advance for considerable distances over difficult terrain, under cover of darkness, and through woods. The battalion commander is responsible that the battalion remains intact and advances in the prescribed direction.

7. **Trains and ammunition supply.**—During the advance in route column the combat train, less the kitchen section, will usually march in rear of the battalion, without distances. The kitchen section and field train will march some distance in rear, depending upon the tactical situation and terrain. If the battalion is acting alone, the kitchen section and field train will be kept within supporting distance of the battalion. If the battalion is acting as part of a larger force, the kitchen section will usually march immediately in rear of the reserve battalion and the field train with the consolidated field trains. The rear echelon of the battalion marches with the kitchen section and the field train. Prior to extending his battalion from route column to an approach formation the battalion commander causes extra munitions to be issued from the munitions section of the combat train. The empty vehicles are sent for refilling to the regimental munitions distributing point that has been designated by the regimental commander. (See TR 420–180.)

8. **The approach march, conditions.**—The battalion develops and continues its advance in the approach march formation, adapted to the terrain, when the dispositions of the enemy are obscure and prompt deployment may be necessary in any direction or when the reconnaissance indicates the approach to a shelled area or an area likely to be shelled.

9. **Orders for the approach march.**—In developing his battalion, the battalion commander assigns the direction of the advance, designates the base company, and prescribes the formation. As a rule the battalion extends on the leading company. The extension is generally best effected by changes of direction of the heads of the companies.

10. **Formation in the approach march.**—The formation will depend upon the situation at the time of the development. If sufficient information is available, the companies are formed in echelons corresponding to the echelons in which they will deploy for attack. Otherwise they are disposed in a formation affording maximum security against losses and adapted to forming for attack in any direction. If adjacent units are not abreast, exposed flanks may be most effectively protected by a formation in which the flanks of the battalion are echeloned to the rear. For example: One rifle company in advance, one rifle company to the right rear, one rifle company to the left rear of the leading company, and the machine-gun company in rear of the center of the three rifle companies. The position of the battalion commander is at the head or in advance of the battalion.

11. **Conduct of the approach march.**—*a.* During the advance of the battalion in the approach formation within its assigned zone, terrain features which are favorable as lines of departure and firing positions are selected successively along the axis of movement and reconnoitered. The route of advance is so selected within the assigned zone that the battalion marches toward its successive direction points in such manner that it will be able to deploy for attack whenever the situation requires on favorable points of the terrain.

b. The direction of the advance should be such as to take advantage of available concealed and covered routes within the zone of advance. The battalion commander regulates the advance of his battalion by assigning successive direction points or azimuths to his base company. When practicable, changes in

direction are communicated to the other companies. Distances and intervals are increased when crossing ridges or other prominent terrain lines which can not be avoided. At times, when they can be approached under cover, it may be advisable to cross particularly dangerous places (roads, crests, embankments) by surprise with whole companies at a time. The units take care not to debouch from cover at the same point. The line or dangerous area may be crossed by successive rushes or individuals widely separated. The unit reforms on a designated line of advance. Temporary variations in distances and intervals, as required by the terrain or the situation, are made by company commanders on their own initiative. The battalion commander is responsible that suitable measures are adopted to reduce the effectiveness of enemy aerial observation.

12. **Supporting weapons in the approach march.**—The position of the machine guns, 3-inch trench mortars, 37-mm. guns, and accompanying gun in the approach march formation depends upon the probability of early action of these weapons and the suitability of the terrain for their use. Although they are disposed so as to be readily available for prompt action, nevertheless they are not to be unnecessarily exposed to possible destruction by a sudden opening of enemy fire within effective range. In the early stages of the advance they follow in rear, later moving up to close support of the assaulting echelon. During the advance a portion of the machine guns are assigned for antiaircraft work.

13. **Reconnaissance during the approach march.**—The battalion commander conducts constant personal reconnaissance with a view of maintaining the prescribed direction of the advance, selecting successive positions, and determining favorable routes. Whenever practicable, shelled areas are avoided. When the battalion commander leaves the battalion for purposes of reconnaissance, the communications personnel and runners maintain connection between the battalion commander and his command post.

14. **Deployment for attack, conditions.**—When it becomes necessary to advance under the protection of its own fire, the battalion deploys for attack. In some cases the battalion commander may assign complete or partial attack missions to his companies before taking up the approach formation. Usually, however, he aims to direct the approach march of his battalion to the most advanced position at which it can be formed for the attack under cover prior to entering the zone of effective small-arms fire, before issuing his attack order. The place (line of departure) chosen for the formation of the battalion for attack should afford concealment and cover. The supporting weapons are disposed so as to render prompt support to the advance of the assaulting units as soon as the assaulting units emerge from cover.

15. **Attack orders.**—The battalion commander usually engages his units by verbal orders to the company and attached unit commanders and staff, assembling them for that purpose when practicable. When time is available he may prepare a written order. He states the information of the enemy and of friendly troops. He announces the mission, time of attack, line of departure, direction of attack, and zone of action of the battalion. He assigns each combat unit its task accompanied by such detailed instructions as may be desirable. He gives instructions regarding trains, the location of distributing points and aid stations, and such other instructions regarding supply and administrative details as are necessary. He designates the battalion axis of signal communications and location of the command post, or where messages will be sent.

16. **Attack formation.**—The battalion deploys for attack with one or two rifle companies in the assault echelon and two or one rifle companies in reserve. Exceptionally, as in a meeting engagement, all three rifle companies may be placed in the assault echelon. Such a deployment causes early mingling of the larger units, renders leadership and control difficult, and robs the commander of his reserve and freedom of action.

17. **Machine guns in the attack.**—*a.* In the initial attack order of the battalion, the mission, initial positions, and usually the targets for the machine-gun company are specified.

The primary mission for the machine-gun company is to support by fire the advance of the rifle companies.

b. There are two general methods of employing the machine-gun company in the attack—

(1) *The machine-gun company supporting the battalion.*—In this method the machine-gun company commander directs the movement of his platoons

from firing position to firing position by the "leapfrog" method, one platoon generally remaining in position while the other goes forward. The rear platoon covers the advance of the forward platoon and constitutes the reserve for use against counterattacks and for the protection of the flanks. The company commander is responsible for the selection of the firing positions, time of advance, and routes of advance to the new positions.

(2) *One machine-gun platoon, supporting a designated rifle company.*—In this method the machine-gun platoon commander directs the movement of his sections from firing position to firing position by the "leapfrog" method, one section generally remaining in position while the other goes forward. The rear section covers the advance of the forward section and constitutes the reserve for use against counterattacks and for protection of the flanks. The machine-gun platoon commander is responsible for the selection of positions, time of advance, and routes of advance to the new positions. The machine-gun commander exercises general supervision over both platoons.

c. The first method is usually employed—

(1) When there is high ground along the center or one flank of the battalion zone of action from which the entire front of the battalion can be covered.

(2) When the fire of the entire machine-gun company is desired on a single area.

(3) When the distance between successive firing positions prohibits the control of the echelon of the command by one officer. The distance is usually from 400 to 800 yards, depending on the terrain.

(4) When it is desirable to hold one or both platoons in reserve. This occurs when there is sufficient fire power from other sources or when the terrain over all or a part of the front is unsuited to the use of machine guns, as, for example, in an attack through woods or over level ground.

d. The second method is employed—

(1) When there is high ground on both flanks of the battalion zone of action.

(2) When the terrain over which the attack is made is broken and the enemy resistance consists of small organized positions, necessitating close machine-gun support with each individual assault company.

(3) When there are woods, a village, or other obstruction in the zone of action which prevent machine guns from covering both flanks from a single position.

e. The first is preferable in order that a reserve of machine-gun fire power may be available to the battalion commander for immediate use.

f. Generally the supporting fire of machine guns will not be actually continuous throughout an entire action. Fire will be applied where the terrain permits and the tactical situation requires. Machine-gun fire will be directed on selected points at selected times in accordance with the battalion commander's orders.

g. Machine guns do not generally participate in an enveloping movement made by part of a battalion. They should be in position and firing to cover the movement.

h. In general, machine-gun platoons are not attached to rifle companies in the attack.

i. When the machine-gun platoon is assigned to support an assault company the rifle company commander may request fire on any target, and it is the mission of the machine-gun platoon commander to supply this fire if possible. (See TR 420–130 and 420–135.)

18. **The 37-mm. gun and 3-inch trench mortar in the attack.**—One platoon from the howitzer company is generally assigned to each attacking battalion. The platoon is used to prepare for and follow up the attack. In the deployment for the attack the weapons of the platoon are installed where they can effectively silence machine guns which may reveal themselves when the attack begins or sweep those parts of the enemy position which endanger the flanks of the attack. To prevent their destruction it is advisable to put the 37-mm. gun and 3-inch trench mortar into action only at the last moment. Any use made of these weapons prior to the attack must not interfere with their advance with the battalion to which they are assigned.

19. **Connecting groups during the attack.**—The attack order for a battalion details connecting groups (squad, section), whose primary duty is to keep the battalion commander informed of the movements and location of the adjacent battalions. They fight only for their own protection or to gain information. They should be as small as practicable. Connecting groups are gen-

erally detailed from the reserve company. They march normally near the flank of the battalion sector.

20. **Mission of battalion commander in the attack.**—If the battalion be one of several in the first line, the battalion commander, in executing his part of the attack, pushes his battalion forward as a coordinated team as vigorously as possible within the assigned zone of action. The great degree of independence allowed him as to details demands, in turn, the exercise of good judgment on his part. Better leadership, better troops, inequality in the hostile resistance, and more favorable terrain enable one battalion to advance more rapidly in attack than another. A battalion so favored insures the further advance of the others.

21. **Conduct of the attack.**—*a.* During the attack the advance of the assaulting companies is mainly in the hands of the assaulting company, platoon, section, and squad commanders, who advance the attack by mutual fire support and alternate fire and movement. The battalion commander intervenes when necessary to push forward companies which hesitate and to insure the necessary cooperation between companies and the supporting weapons. He arranges for mutual support with adjacent units when the situation demands such action.

b. The danger of an uncontrolled merging of the battalion reserve with the assaulting companies is particularly to be guarded against when the assaulting companies are checked in front of a hostile strong point powerfully organized. In this case reinforcement is generally ineffective and an outflanking or enveloping movement is necessary.

22. **Flank protection during the attack.**—*a.* Throughout the advance the battalion commander anticipates possible counterattacks and directs the necessary reconnaissances and security measures to detect and check any menace against his flanks. It is the special duty of units not engaged to be prepared to act immediately in the threatened direction. The machine guns and attached supporting weapons should have mobility of action and be able to change the direction of their fire to meet any threat against the flanks. Dangerous localities must be specially watched and from time to time during the advance the reserve company should be posted in a position from which it can effectively protect the flanks of the battalion by fire or movement, or both.

b. It is frequently necessary during the advance to send out combat patrols from the reserve company—

(1) To cover an interval between the battalion and neighboring units.

(2) To protect the flanks of the battalion when the neighboring battalion is checked in its advance.

(3) To bring oblique or enfilade fire against elements of the defense holding up the advance of the neighboring battalion.

23. **Duties of battalion commander during the attack.**—The principal duties of the battalion commander are—

a. To employ accompanying artillery and supporting infantry weapons in support of the advance of the assaulting companies, and call upon the artillery liaison officer at his headquarters for special artillery support when needed.

b. To maneuver his reserve so as to envelop hostile resistance or cover gaps occurring between assaulting companies.

c. To replace or reinforce assaulting companies when they become depleted in strength.

d. To forward ammunition to the company supports by carrying parties or reinforcements.

e. To take the necessary action to protect the flanks of the battalion or adjacent units against counterattacks.

f. To prevent reserve companies merging with the first line and keep them under the best available cover within supporting distance of the assaulting companies when not advancing. During progression, to select, when practicable, successive positions for the reserve prior to departure from the preceding position.

g. To keep the regimental commander informed regarding the situation.

h. To preserve the assigned direction of the attack.

24. **Position of battalion commander in the attack.**—The position of the battalion commander is such that he can observe the progress of assaulting companies and supporting weapons. The location of the battalion headquarters should be selected, if practicable, so that it will not come under the direct observation and direct fire of the enemy.

25. **Conduct of the assault.**—The hostile position will frequently be reduced by a series of local assaults delivered at different times by small units (squads, sections, platoons, companies). It will sometimes happen, however, that the entire battalion is held up in front of a strong hostile resistance which can not be outflanked. In such case the battalion commander arranges for a prepared and coordinated assault with the support of the artillery and infantry weapons. He either fixes an hour for the delivery of the assault or employs a preconcerted signal for that purpose. With the assistance of the supporting fire, the assaulting units advance as close to the objective as possible and rush the hostile resistance when the supporting fire ceases or is lifted from the objective.

26. **Continuing the attack and pursuit.**—*a.* As soon as a position has been seized heavy fire is brought on the retiring hostile troops and arrangements made for continuing the attack, taking up the pursuit or organizing the position for defense as required by orders for the attack. Where orders require the attack of several successive positions, the attack is continued to seize each successive position as explained for the first position. Front-line companies which become disorganized are leapfrogged by reserve companies, reorganized, and used as reserves.

b. As soon as the objective ordered for the attack has been seized pursuit is taken up. When the battalion is acting independently, the pursuit is taken up on orders from the battalion commander. Reserves and such front-line companies as may be required and are not disorganized are employed to initiate the pursuit. The remainder promptly reorganizes, if required, and follows the new front-line units. When the battalion is acting as part of a larger force, orders for the pursuit are issued by higher authority. Reserves of regiments and higher units and such front-line battalions as may be required and are not disorganized are used to initiate the pursuit. Front-line battalions not employed to initiate the pursuit promptly reorganize, if required, and follow in deployed or approach formation or in route column as demanded by the situation.

27. **Duties of commander in reorganization.**—*a.* After the objective ordered for the attack has been seized, especially when the seizure of the objective involves the seizure of several successive positions, it is frequently necessary to reorganize for further advance. A battalion will not *halt* to reorganize before the objective ordered for the attack has been seized without previous approval from higher authority. Reserve companies will be employed to leapfrog front-line companies which become disorganized and the attack continued until the objective is seized.

b. In reorganizing the battalion, the battalion commander—

(1) Insures reorganization of each unit in the battalion.

(2) Replaces assaulting companies when their fighting power become ineffective.

(3) Makes personal reconnaissance of the terrain to the front and determines a plan of advance.

(4) Brings forward supporting weapons and disposes them to assist most effectively the further advance.

(5) Insures the necessary reconnaissance and security arrangements to locate adjacent units and protect the flanks.

(6) Insures replenishment of ammunition when necessary.

28. **Organization of the ground.**—*a.* When the objective for the attack has been seized and higher orders require this position to be held or when the advance is definitely held up, the battalion commander organizes his battalion for defense. He conducts a reconnaissance and formulates a definite plan. During daylight the assaulting companies take advantage of available cover, shell holes, ditches, and accidents of the ground, and dig in wherever they find themselves; the reserves and supporting weapons being disposed in such a manner that their fire and position, adjusted to that of the assault companies, insure mutual support and concerted action. Under cover of darkness or when readjustment may be made by day, the battalion commander readjusts the dispositions of his battalion, when necessary, and completes the organization for defense on the selected position in accordance with his final plan.

b. His final plan includes—

(1) Establishing his firing line as required by higher orders or by the situation in absence of orders and not less than 200 yards from the enemy position, leaving small security groups in front of it when necessary.

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(2) Designation of security detachments, first-line units, and reserves, and assigning to companies sectors of fire and areas of defense which constitute strong points capable of all-round defense and mutually supporting each other.

(3) Disposing his machine guns so as to flank the front and cover the flanks of the position.

(4) Assigning to reserve units the mission of counterattack and flank protection.

c. Prompt information as to his dispositions is forwarded to the regimental commander and the supporting artillery.

Section II.—THE RESERVE BATTALION IN ATTACK

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29. Mission.—In attack the reserve battalion is disposed in such a manner that it may be brought quickly into action when assigned any of the following missions:

a. To cover the flanks of assaulting battalions.

b. Repel counterattacks, especially on the flanks.

c. Assist the advance of the assaulting battalion.

d. Assist the progress of adjacent units.

e. Take over the rôle of assault.

f. Furnish details for assault battalions.

30. Commander's reconnaissance.—In offensive combat, commanders of reserve battalions no less than commanders of the assaulting battalions must be constantly on the alert. It is imperative that they know the situation confronting them at all times and in detail, in order that they may engage their battalions in an expeditious and effective manner when the need therefor arises. Reserve battalion commanders conduct constant reconnaissance of the ground to their front and flanks and keep themselves informed of the location and action of both friendly and enemy troops.

31. Sources of information.—*a.* The reserve battalion commander keeps himself informed by—

(1) Personal reconnaissance and observation from advantageous points of the terrain.

(2) Observation posts established by his intelligence platoon.

(3) Reconnaissance patrols accompanying assaulting battallions or operating on the flanks of the regiment.

(4) Information received from regimental headquarters.

b. The reserve battalion commander precedes his battalion and takes station where observation is favorable. Frequently he accompanies the regimental commander or is within easy communication with him. When preceding his battalion he is accompanied by such personnel as he deems necessary. His staff keeps the reserve battalion commander advised of information received from the observation stations, from the assaulting battalions, and from the regimental headquarters.

c. Reconnaissance patrols of two or more men from the reserve battalion accompany each assault battalion. These patrols observe the progress of the assaulting battalion and keep in touch with the headquarters of the same. The patrol constitutes a direct means of transmitting information from the commander of the assaulting battalion to the commander of the reserve battalion when reports through regimental headquarters will cause unwarranted delay. It is usually advisable to send small reconnaissance parties to operate on the flanks of the battalion, to report the progress of adjacent units, and to provide for security of the reserve battalion when the situation is obscure.

d. Information relating to the situation is received at regimental headquarters. The reserve battalion commander maintains runners at regimental headquarters to receive and deliver information of value received there.

32. **Conduct.**—The reserve battalion commander moves his battalion forward by bounds, in approach formation, from one position to another, and from cover to cover as directed by the regimental commander or in accordance with his general plan. The commander from his forward position tentatively selects and reconnoiters the position to which the battalion will make the next move. Usually the regimental commander selects the new general location and orders the move.

33. **Position.**—The position selected should afford cover and concealment for the entire battalion in approach formation. Sometimes a concealed and covered position can not be found which will accommodate the entire battalion and it may be necessary to occupy two or more small areas between which communication is easy. The reserve battalion should never be crowded into a position which the enemy may shell suddenly. In order to reduce losses which are likely to result from crowding it may be advisable to place the reserve battalion, or a part of it, in the open, the men digging individual shelter.

34. **Distance from assaulting battalion.**—*a.* The reserve battalion is always posted within supporting distance of the assaulting battalion. In case the terrain is open and observation extends into the enemy area and no other suitable cover is available a reserve battalion may be as far as 2,000 yards from the assaulting wave and still be within supporting distance.

b. How closely a reserve battalion follows the assaulting battalion at the commencement of the assault in stabilized situations depends upon the tactical maneuver expected of it, the location and character of the enemy works, the direction from which they are to be approached, the coordination with adjacent troops, and the enemy's probable method of employing his artillery.

35. **Flank protection.**—*a.* The battalion commander must have the welfare of the flanks of the assaulting battalions constantly in mind. When the situation requires, he disposes elements of his battalion in accordance with the plans of the regimental commander in such manner that he can cover the threatened flank by fire from a position in rear. In making his dispositions for this purpose he does not allow his units to pass beyond his control.

b. He utilizes his machine guns and the howitzer company platoon in so far as the circumstances will permit. Open ground in the vicinity of the threatened flank, together with an elevated position in rear within effective range, is favorable for employment of machine guns. When the threatened flank extends into covered and concealed ground and the situation is obscure, the best protection may be obtained by use of riflemen advantageously placed. In any case, the battalion commander posts only the necessary strength to insure protection of the flanks. The remainder of the battalion is held in readiness for immediate action.

36. **Repelling counterattacks.**—*a.* There will be times during the combat when the dispositions of the assaulting battalions and nature of the terrain will be such as to invite an enemy counterattack. In such case the reserve battalion commander anticipates the probable counterattack and, under the direction of the regimental commander, selects a suitable position and makes proper dispositions to repel it.

b. In selecting a position for the reserve battalion with a view to repelling a probable enemy counterattack, it should be remembered that the most effective manner of breaking up a counterattack is to launch the reserve against the flank of the enemy units while the attack is in progress.

c. The reserve battalion is not actually committed to action, except in an emergency, without the order of the regimental commander.

37. **Assistance to assaulting battalion.**—The reserve battalion assists the progress of the assaulting battalion by fire whenever necessary. For this purpose the fire of its machine guns and attached howitzer company platoon is frequently employed. This assistance is always given when the situation permits and when, by so doing, exposure of riflemen to unnecessary losses may be avoided. The coordination for such assistance is controlled by the regimental commander.

38. **Passage of lines.**—When the reserve battalion takes over the rôle of an assaulting battalion during an attack, it executes a passage of lines. When it is necessary for the reserve battalion to pass over exposed ground before the passage begins, it is advisable to issue the order to the reserve units before they leave their covered positions. The reserve battalion usually advances from its last covered position in small columns in attack formation. Deployment as skirmishers is governed by the class of enemy fire which the advanced elements encounter. During a passage of lines there is a critical moment when

the density of the front line is very much increased; consequently, the duration of the increased density should be reduced to a minimum. In order that the resumption of the advance may fit in with assistance to be rendered by supporting weapons, a very careful calculation of time and space is necessary in order that the passage will be completed at the desired minute. If artillery support has been arranged, it is important that the advanced elements be not exposed to hostile fire before the friendly artillery support begins.

39. Assistance to adjacent units.—The mission of enveloping main hostile resistances usually falls to the reserves. In assisting the advance of adjacent units it may be only necessary in some cases that the reserve battalion places an effective fire on the enemy position. In other cases a well-coordinated attack and assault may have to be made before the enemy can be overcome. In cases where a unit has moved into an adjacent zone of action for the purpose of overcoming resistance, it returns to its own organization as soon as it can be relieved by the adjacent organization.

40. Cleaning up.—*a.* The cleaning up of captured positions is an extremely important operation which must be executed with method and rapidity. Cleaning-up details usually come from the reserve battalion. The details report to the commander of the assaulting battalion who organizes them into a number of groups and assigns to each group certain dugouts, communication trenches, or areas and determines their new mission when they have completed their duties. A certain proportion of the battalion cleaning-up detail is held in reserve to be used against dugouts or areas which may not have been included in the original assignment.

b. In an attack where the cleaning-up process should be begun immediately upon entering the enemy position, it is advisable to have a part of the detail closely follow the first wave. In mobile situations, when operations are conducted in woods or at night, the cleaning-up process is undertaken after the assault wave has passed. In such a situation the ground in the rear of the first wave is closely inspected for enemy groups still holding out. Under these circumstances the cleaning-up details may better perform their duties if they follow the supports at the beginning of the advance.

c. Cleaning-up details can not always use the same methods. In stabilized situations, when enemy resistance is stubborn and the enemy is well entrenched and has made extensive use of field works in depth, cleaning-up parties will usually obtain best results if constituted as bombing squads operating in trenches and using the bayonet and grenades. In mobile situations or when the enemy resistance has been broken after an attack in a stabilized situation, the most rapid results are usually secured if the cleaning-up details deploy and advance over the top of the parapets, using rifle fire.

d. Sometimes cleaning-up details have to undergo hard fighting. Certain of them may have to content themselves with assisting in immobilizing the points of resistance which the commander has decided to envelop and await the reduction of the resistance before commencing the operation of cleaning up.

e. The size of cleaning-up details depends upon the enemy dispositions, habits, and probable resistance. The cleaning up of the whole area is divided into a number of tasks, each suitable for a squad or larger units. The dispositions of the enemy forces and nature of their field works determine the number of tasks, and the number of tasks determines the size of the detail. Their strength varies between a section and a battalion.

f. All cleaning up details from the reserve battalions are, when practicable, complete tactical units, i. e., squads, sections, platoons, etc.

Section III.—THE BATTALION IN DEFENSE

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41. Troops.—The battalion as a tactical unit may engage in defensive combat without having other units attached to it. However, it is usually reinforced by one platoon from the howitzer company.

42. **Elements of the defense.**—When the battalion deploys for defensive combat, the battalion commander provides a security detachment, a holding force, and a reserve.

43. **Security detachments.**—*a.* When the enemy is at a distance from a defensive position, outposts are established by higher authority. Security detachments of battalions holding positions in rear provide local security for such positions. When the enemy is near and no outposts have been established by higher commanders, and when the battle is interrupted by nightfall, each front-line battalion establishes a combat outpost to cover its sector; the action of the combat outposts of the several front-line battalions is coordinated by orders from higher commanders.

b. The strength and location of the security detachment depend upon the situation, the nature of the terrain, and the mission assigned to it. The battalion commander may detail the detachment or he may direct the companies deployed on the battalion main line of resistance to send out outguards or patrols to designated points in their front. When the security detachment does not operate at a very great distance from the battalion main line of resistance, the best control is usually secured if the combat companies send forward detachments to cover each company front in conformity with the plan of the battalion commander. The mission assigned the security detachment of the battalion may include the observation of the enemy; the protection of the companies deployed on the battalion main line of resistance against observation, annoyance, and surprise; and the delay of the hostile advance in order to gain necessary time or force the enemy to disclose his method of attack.

44. **The holding force.**—The battalion commander details certain companies to hold the battalion main line of resistance. He places his rifle companies upon the naturally strong features of the terrain which are to be organized as strong points. Machine guns, when practicable, are located in positions from which they can, in combination, place a continuous band of fire across the entire front, cover the main approaches, and deliver long-range overhead fire. The battalion commander determines the general line of the obstacles in such a manner as to arrest the hostile attack under flanking fire of the machine guns. He makes any adjustment necessary to combine the fighting power of all units (combat groups, strong points, and machine guns) into a powerfully coordinated whole, capable of effective resistance in any direction and of rendering mutual support to adjacent units.

45. **The reserve.**—The chief mission of the reserve is to support the combat troops by counterattack in case of penetration of the strong points on the firing line or the intervals between them. Reserve companies, when practicable, cover the interval between forward combat groups and strong points with fire. A definite place of formation for counterattacks should be assigned them and the best approaches to the front carefully reconnoitered. In order to insure the timely intervention of reserves, it may sometimes be advisable to assign a reserve company definite areas against which, in case of hostile penetration, it will launch its counterattack without waiting for orders.

46. **Reconnaissance.**—When a battalion is assigned a position or area to defend, the battalion commander provides the necessary security and organizes an information and reconnaissance system to detect and report promptly the location and movements of the hostile troops. He studies a map of the area and, accompanied by his company commanders, personally reconnoiters the area which the battalion is to occupy. The battalion commander notes the naturally strong features of the position suitable for organization as strong points and combat groups. He determines specific tasks and areas for each unit.

47. **Orders.**—*a.* The battalion commander assembles his staff and the company commanders of his companies at some point on the position to be occupied and—

(1) Communicates the information regarding the enemy and supporting troops.

(2) Indicates the main position for the whole force, the limits of the position assigned the regiment, the battalion and the adjacent units, and the sectors of fire of any weapons supporting the battalion.

(3) Prescribes the location of the firing line and of the support line.

(4) Designates companies as combat companies or reserve and details the necessary reconnaissance and security detachments.

(5) Assigns them to positions in readiness or portions of the battalion positions to be organized as strong points.

(6) Indicates the combat emplacements to be constructed and assigns sectors of fire to the combat companies and machine guns.

(7) Assigns the counterattack missions to the reserve and prescribes the location of the 37-mm. guns, 3-inch trench mortars and artillery pieces, as well as assigning them combat missions, as required by the situation, when these weapons are attached to the battalion.

(8) Prescribes such details relative to the tracing of field works as the time available may permit and the situation requires.

(9) Details working parties for clearing the field of fire, the construction of obstacles and shelter, and for such other purposes as may be immediately necessary.

(10) Indicates to the intelligence officer the location of necessary observation posts.

(11) Details the necessary carrying parties and prescribes the location of the combat train, munitions and supply points, the battalion aid station, and his own command post.

b. If the battalion occupies a position or area for a considerable period, he regulates internal reliefs of the battalion according to the arduousness of the service, for the purpose of maintaining the maximum fighting efficiency of the battalion. The regimental commander will be notified of the relief contemplated before it is made.

48. Field works.—When the plan of field fortifications has not been previously determined, the battalion commander supervises the construction of the field works of the position. He insures that the several combat emplacements of the rifle companies and machine guns are so located and constructed that no dead space exists in the field of fire, that the emplacements mutually protect the flanks of each other, and that they can deliver flanking fire across the front of the adjacent groups. He details such parties from the reserve as may be necessary to assist in the construction of the works on the firing line. When provision has been made for the construction of the most essential features of his position, he details additional working parties for the construction of approach trenches in his combat companies. He prescribes the construction of such dummy trenches as the situation makes desirable. When natural cover for the protection of reserves is not available and it is necessary to construct cover trenches, such trenches are, when practicable, sited for all-round defense and so constructed as to form a reserve position where hostile penetration between forward combat groups and strong points may be checked.

49. Machine guns.—In addition to their flanking field of fire, machine guns are, when practicable, so sited that they can take the attack under fire at long range. Positions which permit of long-range fire from concealment (thickets, etc.) are specially favorable, as they prevent the premature destruction of machine guns by hostile artillery. A certain proportion of machine guns are echeloned in depth in rear of the strong points on the firing line in such manner as to be able to take hostile elements, which may penetrate the line of forward strong points, under flanking fire; also to deliver long-range fire over the firing line or through the intervals between combat groups. Alternative positions are selected. In order that the fire of the greatest possible number of machine guns may be concentrated on any point in front of the position they are sited so that they have as large a field of fire as possible.

50. Command post.—The battalion commander establishes his command post where it has advantages in concealment and communication. He maintains communication with his companies, with adjacent units, and the rear by the means provided by his communications platoon.

51. Position in readiness.—When the battalion is acting alone and the location and intentions of the enemy are not sufficiently known, the battalion takes up a position in readiness from which it can promptly move and deploy to meet the advance of the enemy. When time is available it may be advisable to dig fire trenches for probable occupation, the battalion afterward being assembled under cover in rear. The necessary reconnaissance and security patrols are maintained to observe the enemy movements and prevent surprise.

52. Covering force.—*a.* A battalion may sometimes be employed as a covering force in front of a defensive position for the purpose of—

(1) Securing the occupation and organization for the main line of resistance.

(2) Delaying the enemy advance and gaining time for manning the main line of resistance.

(3) Limiting the effect of surprise, and forcing the enemy to disclose his intentions before he can reach the main line of resistance.

b. When deployed as a covering force, the battalion is guided by the same principles which govern the occupation of a defensive position. Less powerful coordination is possible when acting as a covering force because of the greater front which is usually assigned to the battalion. Particular attention is given to reconnaissance measures (patrols, observation posts, and listening posts) and communication within the battalion area and with the supporting weapons. Machine guns are usually not located in advance of the main line of resistance of the battalion.

TRAINING REGULATIONS, No. 420–170

INFANTRY

Combat Principles—The Infantry Regiment

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Section I.—THE REGIMENT IN ATTACK

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1. Advance into action.—*a.* Having been assigned his mission, the regimental commander conducts the advance of his regiment into action.

b. He details the necessary covering detachments to secure the march of the regiment and develop the enemy's position.

c. The fact that cavalry patrols are known to be posted in certain directions does not relieve him of the responsibility for reconnaissance and security.

d. Contact is maintained within his own organization and with adjoining columns.

e. His post is with or in advance of the leading battalion of his regiment. He should be as far to the front as practicable, in order that he may personally see the situation, order the deployment, and begin the action strictly in accordance with his own wishes.

f. He regulates the advance of the regiment by assigning successive direction points, routes of advance, or zones of action to his battalions, special and attached units.

g. (1) When the nature of the deployment can be foreseen, he gives his battalions, special and attached units, march directions which will bring them to their proper places at the proper time and with a minimum of casualties. Advantage is taken of all covered routes which the terrain affords.

(2) When the nature of the deployment can not be foreseen, he causes the regiment to advance in an advance-guard formation.

h. When it is necessary for the regiment to pass through deployed artillery, it is advisable that he confer with the artillery commander on such passage so as to effect the movement to the best advantage.

2. Deployment.—*a.* The regiment deploys for action with—

(1) Two battalions in the assaulting echelon and one in reserve.

(2) One battalion in the assaulting echelon and two in reserve. (Both of the reserve battalions may be at the disposition of the regimental commander or only one battalion, the other being held in brigade or division reserve.)

(3) Exceptionally, three battalions abreast.

b. As a general rule, a definite frontage is assigned to the regiment. From a consideration of the frontage assigned and of other factors, such as the nature of the terrain, the regimental commander determines the number of battalions to be assigned to the assaulting echelon and disposes the component parts of the regiment accordingly. When the regiment is acting alone, a reserve is always held out during the initial stages.

c. The regimental commander attaches to the units of his assault echelon such other weapons and troops under his command as are necessary to carry out their missions.

d. He retains direct control of his reserve units and such of the attached weapons and troops as are not disposed of as in subparagraph *c.*

e. Howitzer company.—(1) When hostile machine guns are likely to be encountered and the terrain is suitable for the use of 37-mm. guns and 3-inch trench mortars, at least one platoon of the howitzer company is employed to assist each assaulting battalion.

(2) Elements of the howitzer company employed for continuous operations with a battalion are attached thereto.

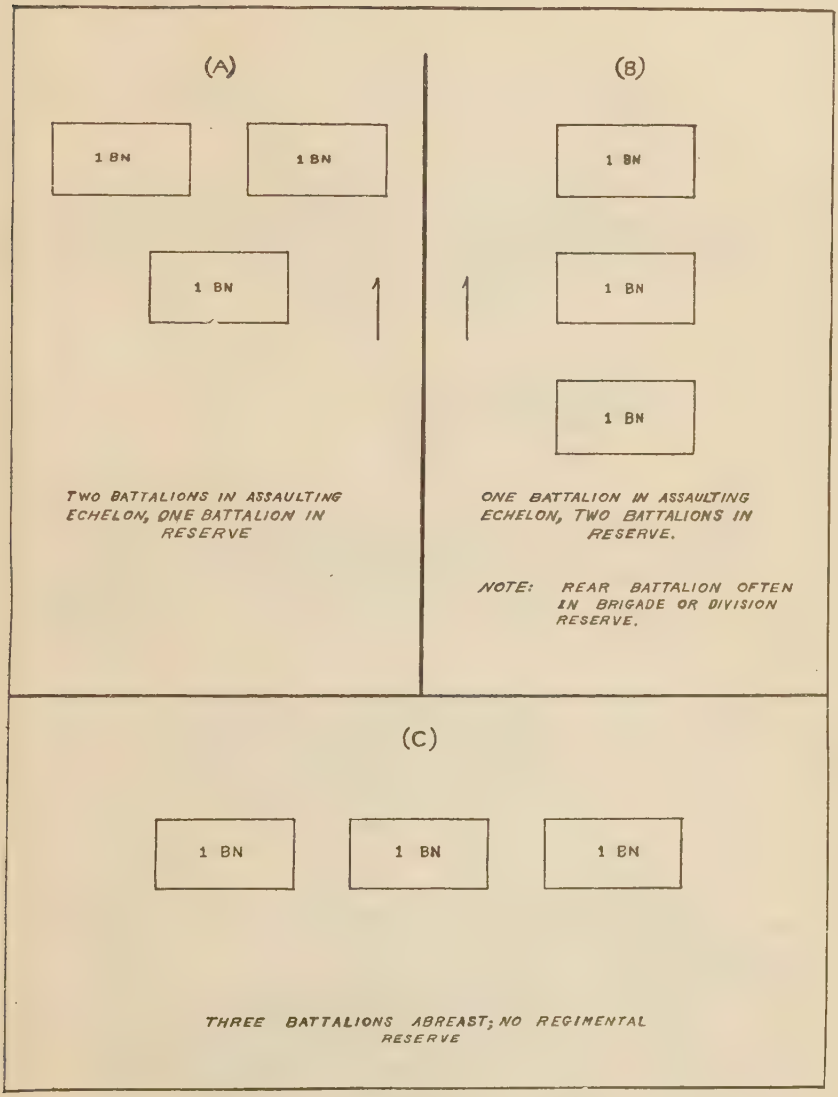

PLATE 88.—Deployments of the regiment

(3) The howitzer company, less elements attached to assaulting battalions, may be held under direct control of the regimental commander or it may be attached to the reserve.

(4) It is usually best to attach one howitzer company platoon to each assault battalion. Each assault battalion is then a complete tactical unit, controlling every kind of regimental weapon.

f. Attached artillery.—(1) Accompanying guns attached to the regiment are usually attached to the assaulting battalions.

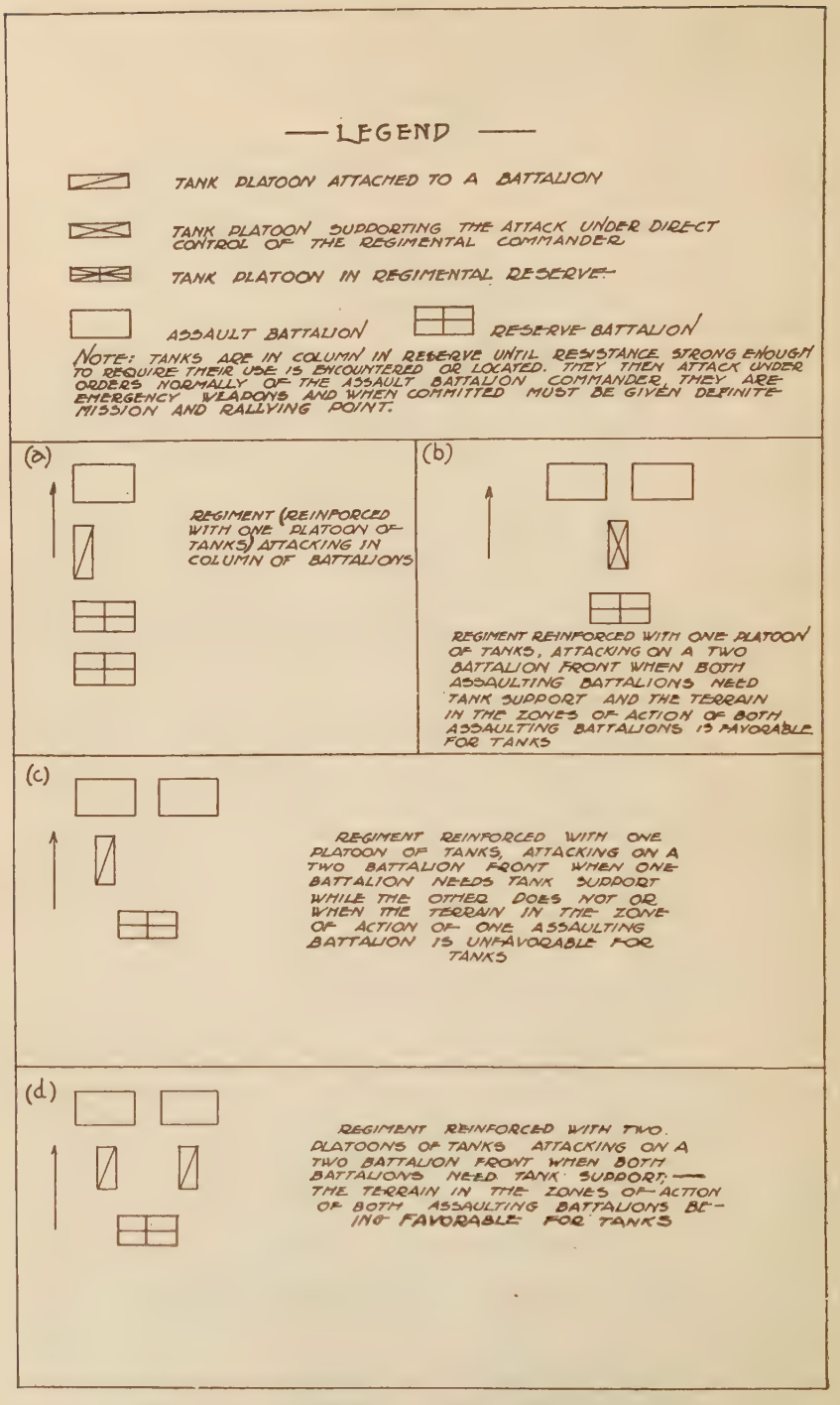

PLATE 89.—The disposition of tanks attached to a regiment

(2) Accompanying batteries attached to the regiment are usually held under control of the regimental commander.

g. Attached tanks.—(1) Tanks attached to the regiment are either held under direct control of the regimental commander or attached to the assault echelon,

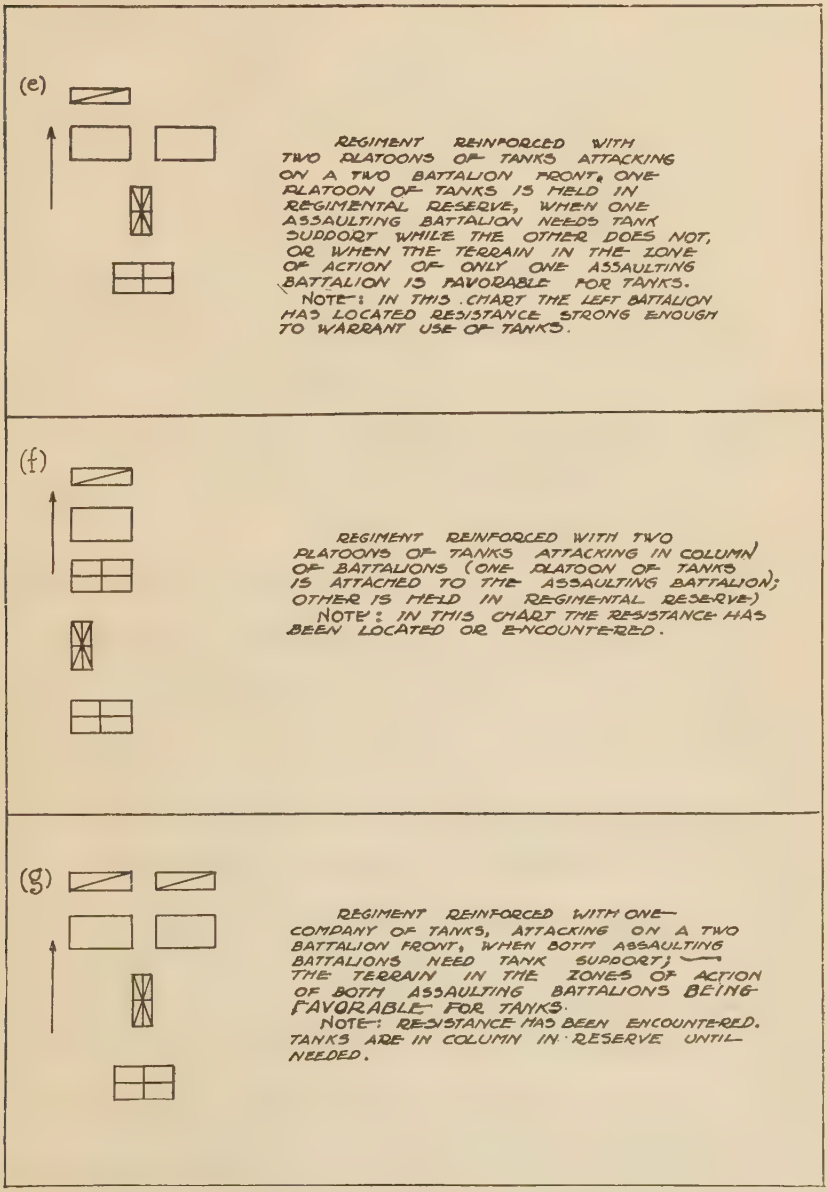

PLATE 90.—A continuation of Plate 89

according to the information of the enemy, the terrain, the number of battalions in the reserve echelon, and the number of tank platoons attached to the regiment. If more than one platoon is attached to the regiment, part may be attached to the assault echelon and the remainder held in regimental reserve.

(2) When the regiment is to attack in column of battalions and one platoon of tanks is attached to the regiment, it is usually attached to the assaulting battalion. If more than one platoon of tanks is attached to the regiment, one platoon is usually attached to the assaulting battalion and the remainder held in regimenal reserve.

(3) When only one platoon of tanks is attached to the regiment and the regiment is to attack on a two-battalion front, the tanks are usually held under the regimental commander's control, provided that the terrain in the zones of action of both assaulting battalions is favorable for tanks and both assaulting battalions may have equal need of tank support. If the terrain in the zone of action of one of the assaulting battalions is unfavorable for tanks, the platoon is attached to the other assaulting battalion. If the enemy is known to be considerably stronger in the zone of action of one battalion than in that of the other, the platoon is usually attached to the assaulting battalion expected to encounter the stronger resistance.

(4) When the regiment is to attack on a two-battalion front and two platoons of tanks are attached to the regiment, one platoon is attached to each assaulting battalion when both are expected to meet strong resistance and if the terrain in the zones of action of both is favorable for tanks. If the terrain in the zone of action of one assaulting battalion is unfavorable for tanks, however, one platoon is usually attached to the assaulting battalion which will pass over favorable ground, the other platoon being held in regimental reserve. If only one of the assaulting battalions is expected to encounter resistance warranting the use of tanks, one platoon is usually attached to that battalion, the other platoon being held in regimental reserve.

(5) If more than two platoons of tanks are attached to the regiment, at least one platoon will in ordinary situations be held in regimental reserve.

(6) More than one platoon of tanks will not be assigned to an assault battalion unless its front be exceptionally extended or an unusual situation develops or is anticipated in which, to secure success, the use of more than one platoon is deemed necessary.

(7) The regimental commander causes tanks attached to assaulting battalions to revert to his control when they are no longer needed or when the character of the terrain prevents their further use.

h. If the enemy occupies a highly organized position, the regimental commander usually attaches units from the regimental reserve to the assaulting battalions for the purpose of cleaning up ground passed over. Such units may vary in strength from a section to a battalion according to the available information as to the enemy's dispositions.

i. When the regiment can be deliberately formed for combat he prescribes—

(1) The line of departure and the positions of his assaulting battalions thereon.

(2) The position or positions to be taken by the reserve and the supporting weapons held under his control.

(3) The location of his command post, the regimental aid station (if set up), the regimental distributing point, and the regimental munitions distributing point.

j. Where time does not permit of a deliberate deployment regulated in detail, he deploys the regiment by assigning objectives or march directions to his battalions, special and attached units, that will bring them into the formation desired.

k. If the regiment is on a flank of a general line, he provides for the necessary reconnaissance and security on that flank unless it has been otherwise provided for by higher authority. In any event he sends out combat patrols as needed.

l. When the regiment, in conjunction with other troops, is to attack, he details the necessary connecting groups to maintain contact with adjacent troops. Such connecting groups are ordinarily detailed from the reserve.

3. The attack.—*a.* The regimental commander engages his regiment by assigning combat missions to his available battalions and to the attached units held under his direct control.

b. When possible to do so, he initiates the attack by prescribing the hour when it shall be launched.

c. During combat he keeps in touch with the situation to his front and flanks by personal observation and reconnaissance and by means of information received from his battalions, adjacent units, higher commanders, observation posts and patrols of the intelligence section, and special patrols.

d. He is habitually located at the regimental command post except when on a definite mission or reconnaissance. He returns to his command post as soon as possible. He can not normally control the action of the regiment while on reconnaissance, due to incomplete knowledge of the entire situation.

e. He will be prepared at all times to influence the progress of the attack by timely action. His means of influencing the attack are—

(1) Personal influence.

(2) Use of weapons under his direct control.

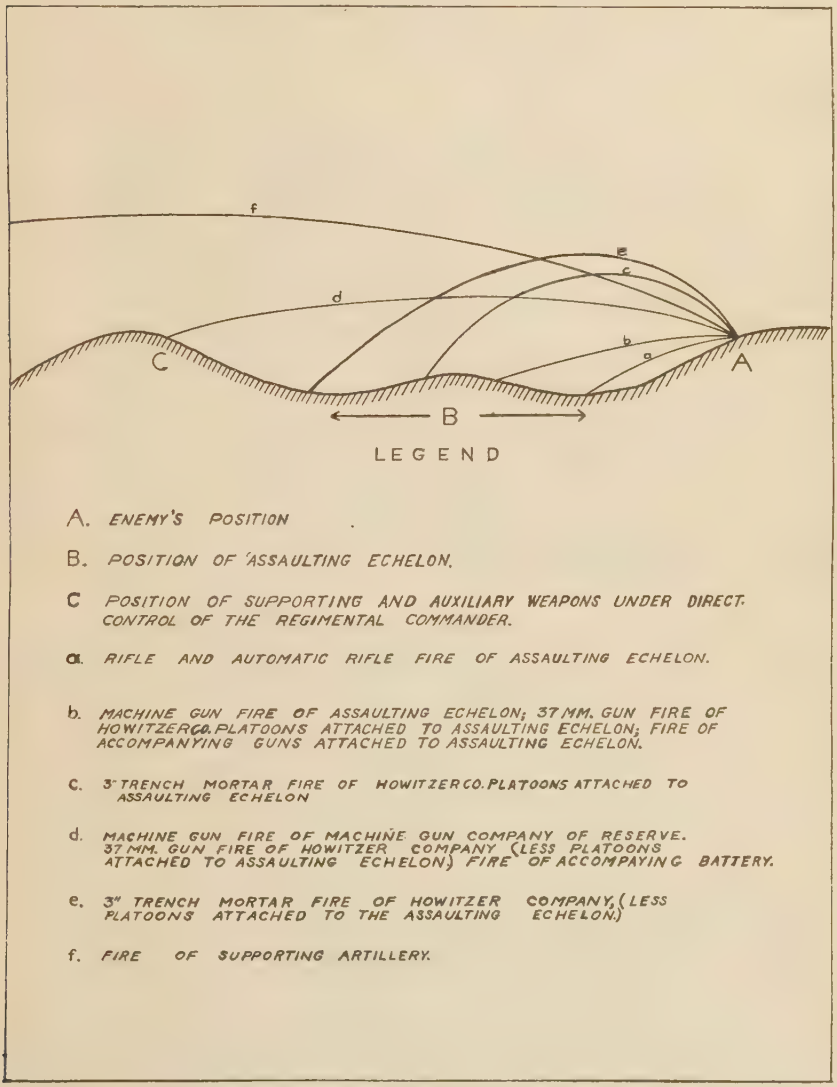

PLATE 91.—The fire of weapons within, attached to, and supporting the regiment

(3) Arrangement for fire of supporting artillery.

(4) Arrangement for cooperation between battalions and with adjacent organizations.

(5) Use of the reserve.

f. If he observes that any of his battalions or other units are becoming disorganized or not making proper progress, his mere presence is sometimes the

one influence necessary to restore order and insure proper progress of the attack. Similarly, a timely word of encouragement or advice will sometimes have very beneficial results.

g. He will apply the power of the weapons under his direct control where it will best assist the assaulting troops, as follows:

(1) Elements of the howitzer company are employed for preparatory fire, to support assaulting battalions in their attacks, and to repel counterattacks.

(2) When accompanying artillery is attached to a regiment, it is employed for fire on the stronger points of resistance, for defense against local counter-

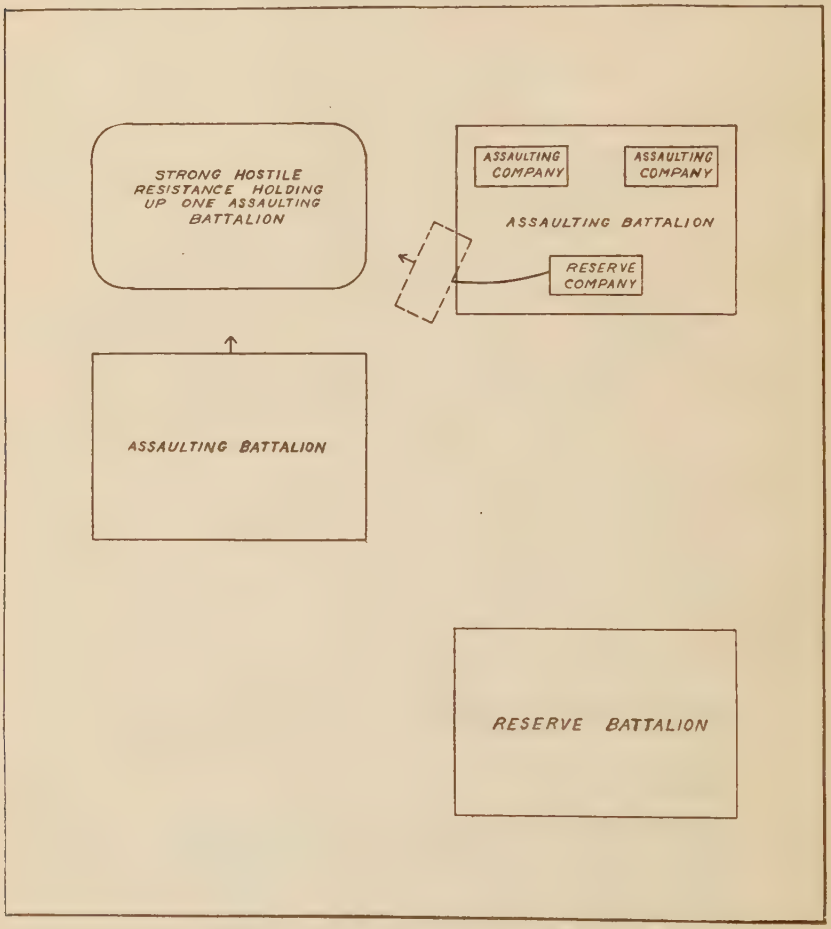

PLATE 92.—The employment of an assaulting battalion, in favorable position, to assist another battalion held up by strong hostile resistance

attacks, and for fire on hostile reserves. In assigning a mission to the battery, the regimental commander states definitely the locality to be fired on, the amount and nature of expected resistance, and the positions of friendly troops. The selection of firing positions is left, within rather wide limits, to the artillery commander. The time of attack is preferably arranged after consulting the artillery commander as to the time necessary for the latter to go into action.

h. The regimental commander can often exert a decided influence on the action by arranging for fire of the supporting artillery on strong hostile resistance or hostile batteries. He submits his requests for artillery fire to the commander of the artillery unit assigned to the support of the regiment. In

the event that no particular unit is assigned to the support of the regiment, he submits his request for fire to his brigade commander.

i. Cooperation between units.—(1) The regimental commander will be prepared to direct a favorably situated assaulting battalion to assist by fire or maneuver an adjacent battalion which is held up by strong hostile resistance. He does not ordinarily direct one of his battalions to assist elements of an adjacent regiment without first reaching an understanding with the commander of that regiment.

(2) He will not hesitate to ask for assistance from an adjacent regiment which is in a favorable position to render it.

j. Use of the reserve.—(1) He influences the action primarily by using his reserve at the proper time and place, and in the proper direction.

(2) He regulates the advance of reserve battalions by prescribing successive positions to be occupied.

(3) He holds them in readiness to guard against counterattack, especially on the flanks, to give fresh impulse to the attack by executing a passage of lines through a disorganized, depleted, or exhausted assaulting battalion, or to assist an assaulting battalion which is held up.

(4) Against counterattacks a reserve battalion is most effectively employed when it is launched against the enemy's flank while the counterattack is in full progress. (See pl. 93.)

(5) The machine-gun company of a reserve battalion or elements of the howitzer company attached to a reserve battalion are often advantageously used in temporary support of an assaulting battalion when additional fire support only is all that is required. (See pl. 91.)

(6) To assist by maneuver an assaulting battalion which is held up by strong hostile resistance, a reserve battalion may be employed to reinforce the assaulting battalion by extending the front or enveloping the flank of the resistance which is holding up the attack. The regimental commander generally puts his reserve into action where the least losses are being suffered rather than where they are the greatest.

(7) At critical junctures the situation may require the regimental commander to lead his reserve into action in person.

(8) Elements of reserve battalions may sometimes be placed at the disposition of assaulting battalions when the latter become depleted in strength. Except for temporarily detaching machine-gun companies and howitzer company platoons, every effort is made to maintain the reserve battalions intact and engage them as units.

(9) When the hostile line has been penetrated the regimental commander employs his reserves to exploit the success.

k. He keeps the brigade commander informed of the situation and of his actions. He keeps the commander of the artillery unit, assigned to support the regiment, informed of the infantry situation and arranges for a mutual interchange of information.

l. By mutual cooperation between the regimental commander and the commander of the supporting artillery, the command posts of the two commanders are located as near together as the situation permits. The regimental commander does not move his command post during combat without giving the supporting artillery commander sufficient warning to permit the latter to establish new signal communications.

4. Pursuit.—*a.* When the regiment reaches its objective, the regimental commander takes steps to follow and maintain contact with the enemy, retreating in his front, by vigorous patrolling. If any regimental reserves are still in hand they are employed to exploit the success. He makes proper disposition to hold the ground and meet any counterattacks which the enemy may make.

b. When the enemy gets beyond range of fire of the assault echelon and the danger of counterattack seems removed, the regiment is reorganized, munitions replenished, the wounded evacuated, and preparations made for the direct pursuit, but the pursuit is not inaugurated without orders from higher authority.

c. When engaged in the pursuit, the regiment advances in battle formation while within effective range of the enemy. When out of effective range of hostile artillery, the regimental commander forms his regiment in route column, detailing the necessary covering detachments. During the pursuit, he is as far forward as practicable.

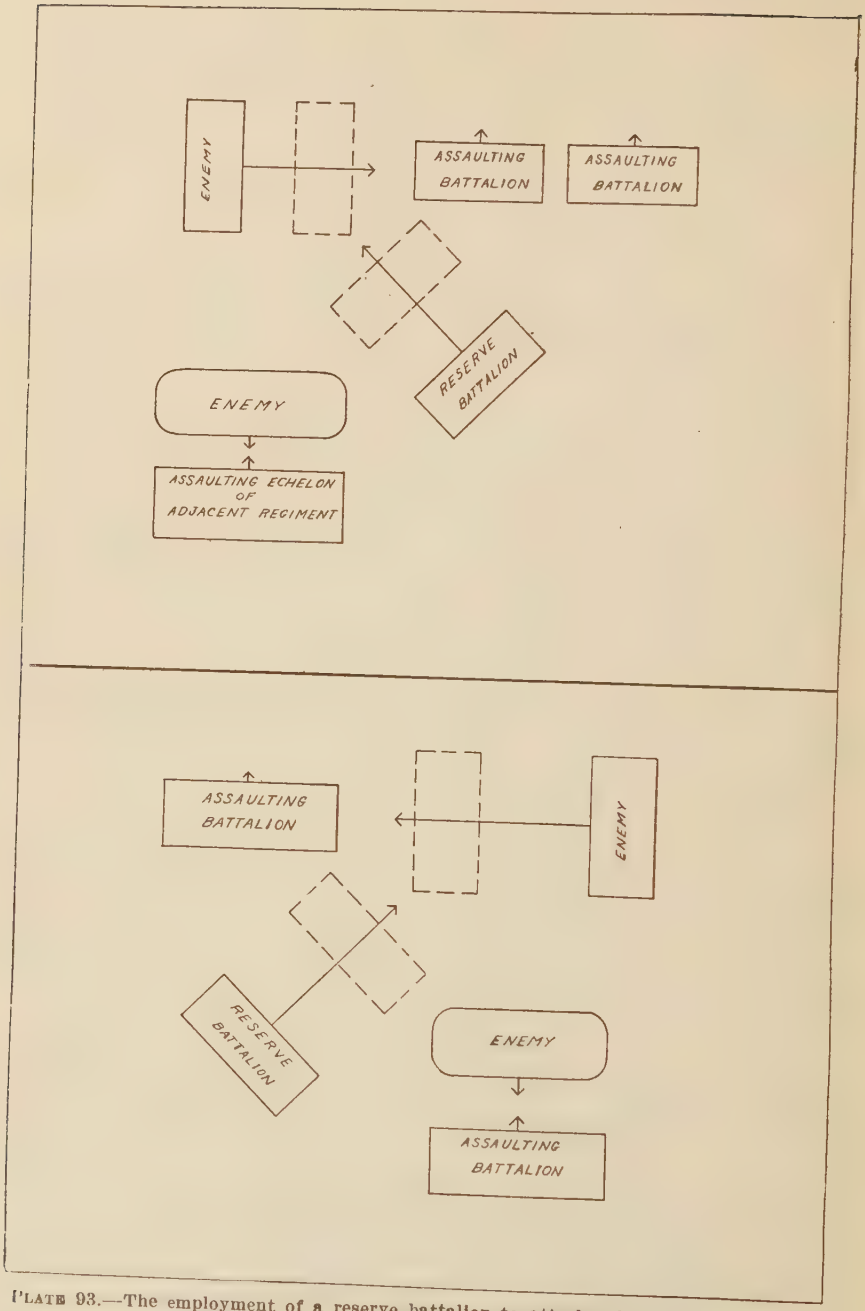

PLATE 93.—The employment of a reserve battalion to attack a hostile counterattack directed at a section of the assaulting echelon

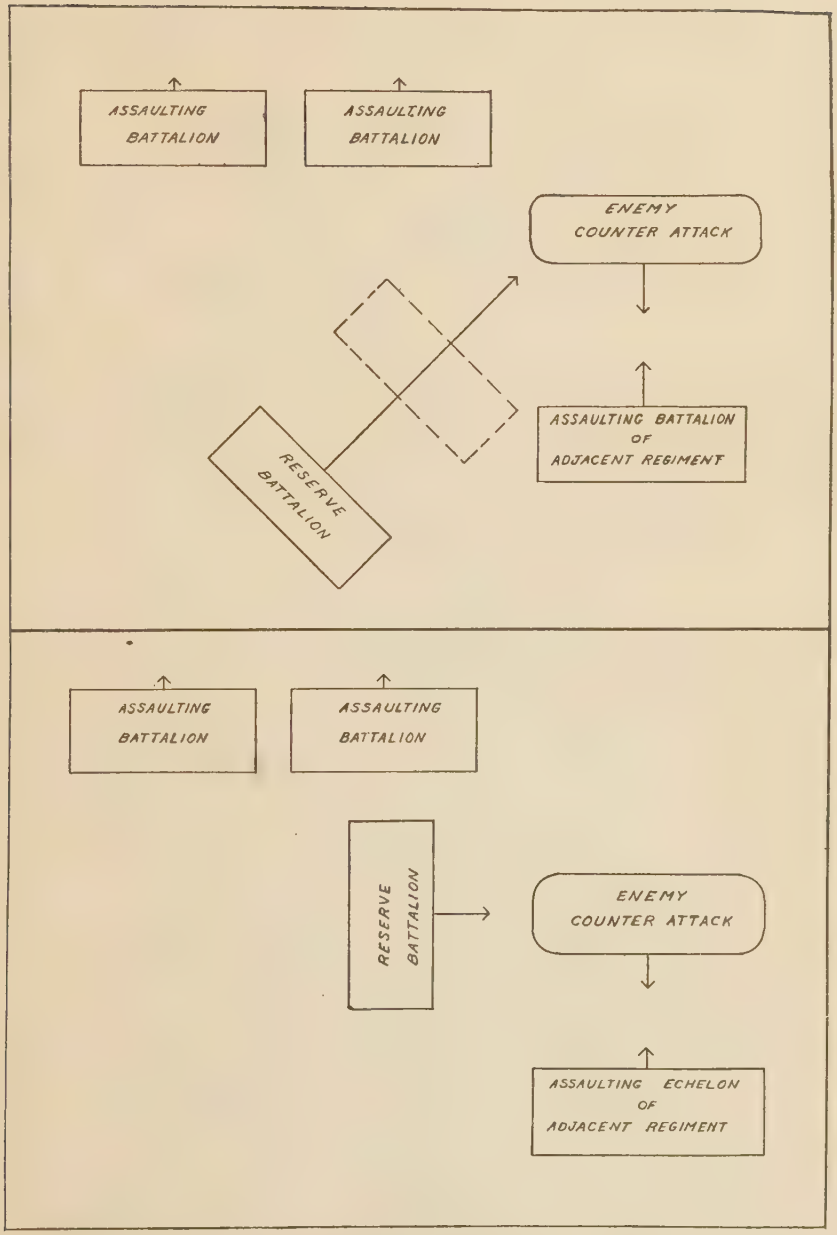

PLATE 93—Continued

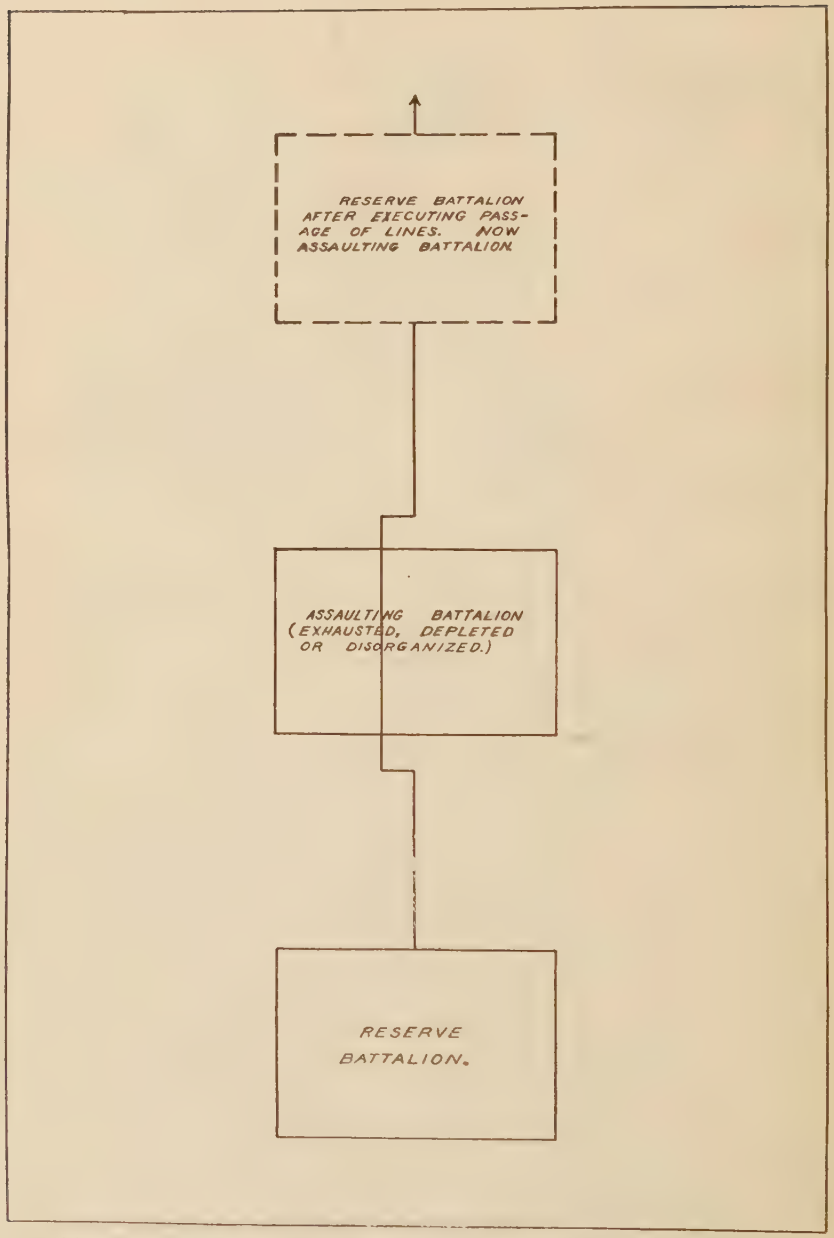

PLATE 94.—The employment of a reserve battalion to give a fresh impulse to the attack by passing it through an exhausted, depleted, or disorganized assaulting battalion

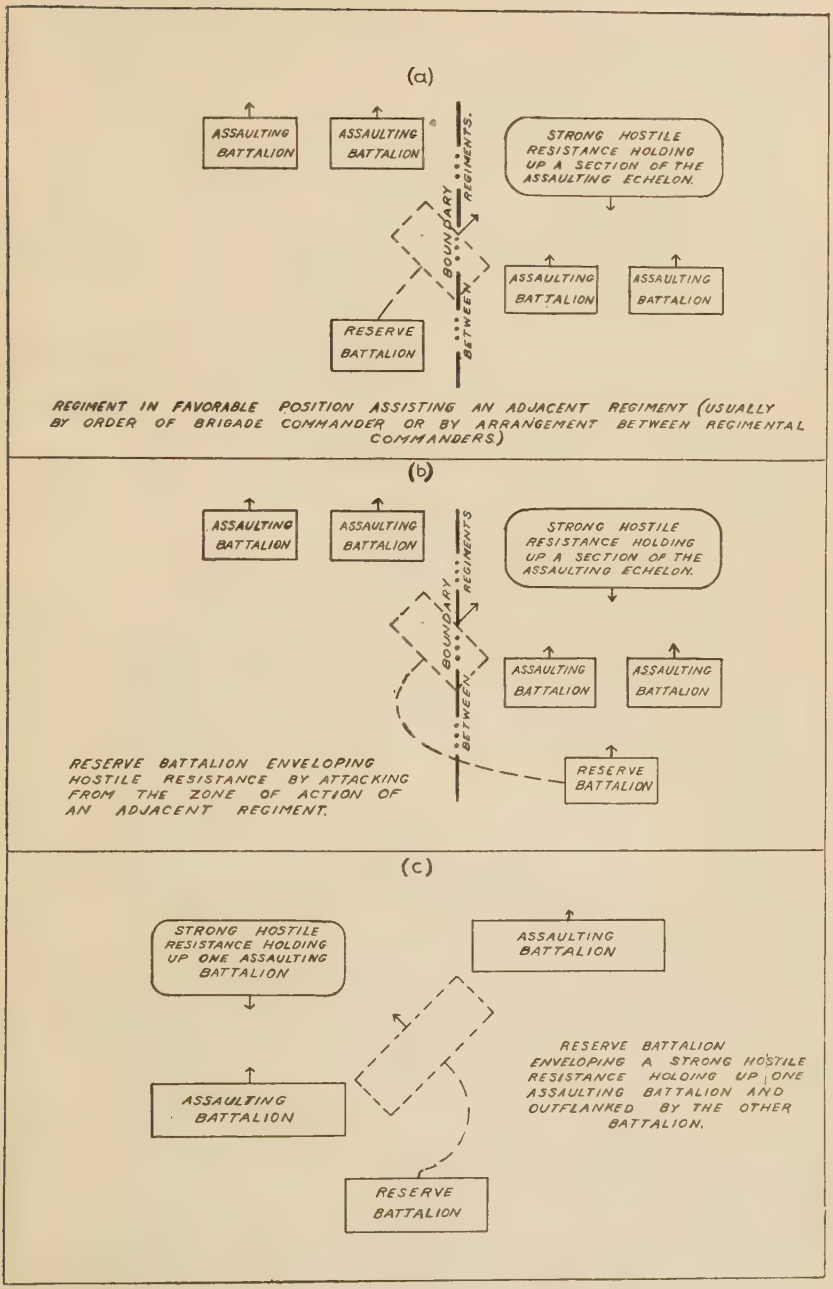

PLATE 95.—The employment of a reserve battalion to take in flank strong hostile resistance holding up a section of the assaulting echelon

5. Organization of the ground.—Where the advance of the regiment is definitely held up, the regimental commander takes steps for the security of the regiment and holding of the ground. He fixes the line of resistance and assigns sections of it to the assaulting battalions. He arranges for artillery support and, through the regimental machine-gun officer, coordinates the disposition of the machine-gun companies of the regiment.

6. Supply.—The regimental commander directs and supervises the services of supply of the regiment. (See TR 420–180.)

7. Medical service.—*a.* The regimental commander directs and supervises the medical service of the regiment, which is performed by the attached Medical Department personnel.

b. During steady progression, the regimental aid station is usually not set up.

c. During the attack, the regimental responsibility in respect to casualties consists in the collection, dressing, and care of the wounded prior to their evacuation by the medical regiment of the division.

d. Except when acting alone, the regiment has no responsibility in respect to evacuation.

8. Prisoners.—*a.* Prisoners are turned over by assaulting battalions at points designated by the regimental commander. The regimental collecting point for prisoners is usually in the vicinity of the command post.

b. From the regimental collecting point, prisoners are evacuated, ordinarily, by military police, as directed by higher authorities. If necessary, troops from the reserve are used to convoy prisoners to the rear.

9. Stragglers.—*a.* The regiment will have an organized system for the collection and disposition of stragglers.

b. When necessary, patrols are detailed from the reserve to collect and deliver stragglers to their respective battalions.

c. Designated collection points for stragglers are usually in the vicinity of the regimental command post. (See TR 420–180.)

10. Pioneer platoon.—*a.* During steady progression, detachments of the pioneer platoon may be used as follows:

(1) To reconnoiter, repair, and construct roads, bridges, fords, and ferries.

(2) To collect information with reference to the amount and kind of engineer matériel and tools available; character of the soil as affecting the construction of field works; location, quantity, and general quality of water supply; and possible camp sites.

(3) To remove obstacles, including a search for and destruction of enemy mines and traps.

(4) To mark routes by erection of signboards.

(5) To control troop movements over temporary or dangerous bridges and fords.

b. During the attack the platoon may operate as follows:

(1) Prepare command and observation posts for regimental headquarters.

(2) Assist the advance of accompanying artillery, tanks, 3-inch trench mortars, and 37-mm. guns.

(3) Perform the necessary engineer work for the rapid advance of the infantry over shell-torn or other rough ground.

c. During periods of stabilization the platoon may be employed as follows:

(1) On incidental engineer work, including the construction of temporary shelter and command and observation posts for regimental headquarters.

(2) Detachments may be sent to the battalions to supervise work of this character.

Section II.—THE REGIMENT IN DEFENSE

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Medical service	17
Conduct of the defense	18

11. Reconnaissance and security.—*a.* When the regiment takes up the defensive, the regimental commander immediately takes the necessary steps to obtain information of the enemy and of the terrain and to provide for the security of the regiment.

b. Unless the regiment is already in contact with the enemy, he sends out the necessary patrols to locate the enemy and to keep him under constant observation.

c. He obtains information of the terrain by the study of maps, by personal reconnaissance, and by sending out reconnoitering parties for this purpose.

d. He provides for the security of the regiment by detailing the necessary covering detachments. If time must be gained for the organization and occupation of the position, he details a detachment sufficiently strong to delay and harass the enemy's advance. Even if other troops are covering the occupation and organization of the position of the regiment, he provides for local security.

e. From the information obtained by personal reconnaissance and from other sources, he formulates his plans for disposing the regiment and for organizing the ground. In making these plans, preparations for assuming or resuming the offensive are considered as well as purely defensive measures.

12. Deployment.—*a.* In the deployed and position defenses, the regiment usually deploys with two battalions in the assault echelon and one in reserve or with one battalion in the assault echelon and two in the reserve. In the latter case, one battalion is often held in brigade or division reserve. Deployment is usually made on four lines: Firing line, support line, battalion reserve line, and regimental reserve line. Exceptionally, all three battalions may be deployed abreast.

b. In the zone defense, in addition to the assault and reserve echelons, there may also be a line of outposts, consisting of a battalion or fraction of a battalion.

c. The attachment to battalions of 37-mm. guns and 3-inch trench mortars is made as in the attack.

d. The regimental commander designates his battalions as assault battalions and reserve.

e. He assigns sections of the defensive position to his assault battalions and positions in readiness to his reserve, or prescribes the defensive works to be constructed and assigns elements of the regiment to their construction and occupation.

f. Through his regimental machine-gun officer, he coordinates the machine-gun fire of his battalions with each other and with adjacent regiments.

g. When necessary he details connecting groups for maintenance of connection with adjacent troops and security detachments for flank protection.

h. When the regiment is deployed over two positions, he fixes the boundary between the two positions.

i. He supervises the tactical disposition of the troops and insures coordination between subordinate units.

j. He insures coordination of the defensive fire of the supporting artillery with that of the other supporting arms and weapons.

13. Organization of the ground.—*a.* In the deployed defense, the regimental commander usually leaves the organization of the ground to the initiative of battalion and lower commanders. When the regiment is engaged in a deployed defensive delaying action, he may prescribe the entrenching of critical pivotal areas and the construction of dummy works.

b. In the position defense, he prescribes the firing line (line of resistance), the battalion reserve line, the areas to be organized as centers of resistance, and the location and character of the works to be constructed by the regimental reserve.

c. In the zone defense he prescribes the position, or positions, and the detached works which are to be constructed, prepares a plan of work and supervises the construction of the defense.

d. The pioneer platoon is employed to construct command posts and observation posts, to render dugouts gas-proof, and to perform other pioneer duties. (See par. 10.)

e. The regimental commander allots to his battalions matériel and personnel of the pioneer platoon and attached engineers for work under direction of the battalion commanders.

f. He details such working and carrying parties from his reserve, as are not required for the construction of cover for their own protection, to assist in the construction of approach trenches and of defensive works for the assault battalions.

14. Administration and supply.—*a.* The regimental commander directs and supervises the service of supply of the regiment. He prescribes the location

of the rear echelon and causes points of distribution for munitions, engineer matériel, and other supplies to be established.

b. When the regiment occupies a position or zone for a considerable period, he regulates internal reliefs within his regiment, according to the arduousness of the service, for the purpose of maintaining the maximum fighting efficiency of the regiment.

c. When part of the regiment is resting in the rear, he prescribes and supervises its training.

d. He fixes the direction of circulation in his subsector by the designation of "In" and "Out" trenches and "One-way" roads.

15. Communications.—The regimental commander prescribes the location of his command post and supervises the establishment and maintenance of communications with his battalions, adjacent units, and between the forward and rear echelons of the regiment. He insures the establishment of pyrotechnic signal communications from the front lines to the supporting artillery.

16. Observation posts.—The regimental commander supervises the establishment of observation posts by his intelligence officer.

17. Medical service.—The regimental commander prescribes the location of the regimental aid station and supervises the medical service within the sector of the regiment. When the regiment is acting alone, he also supervises evacuation.

18. Conduct of the defense.—*a.* The regimental commander influences the action primarily by employing his reserve at the proper time and in the proper direction.

b. In order to facilitate prompt action, he causes the commander of the reserve to reconnoiter probable bases of departure for counterattacks and routes thereto prior to the stage of decisive action.

c. In the active defense the reserve is employed to counterattack for the purpose of changing from a defensive to an offensive attitude.

d. In the passive defense the reserve is employed to counterattack, to expel hostile troops which have reached or penetrated the position and which the assault battalions are unable to eject.

e. In a delaying action the reserve is employed as in a passive defense, unless successive positions are occupied. In the latter case the reserve is employed to cover the withdrawal of the assault echelon and, if necessary, to continue the delaying action.

f. Except in emergencies, the reserve is employed only upon orders from the regimental commander.

g. A counterattack made with the reserve is most effective when it is launched against the enemy's flank while his attack is in full progress.

TRAINING REGULATIONS, NO. 420-180

INFANTRY

Combat Principles—The Service Company, Infantry Regiment

		Paragraphs
SECTION I.	Introduction	1
II.	Operations of the regimental supply system in combat	2–5
III.	The execution of the administrative and personnel work of the regimental headquarters	6–7
IV.	The band section in combat	8
V.	Duties of personnel in combat	9–14

Section I.—INTRODUCTION

	Paragraph
Functions	1

1. **Functions.**—The service company has two functions in combat—

a. The supply of the regiment.

b. The execution of the administrative and personnel work of the regimental headquarters.

Section II.—OPERATIONS OF THE REGIMENTAL SUPPLY SYSTEM IN COMBAT

(See Charts 1, 2, 3, 4, and 6)

	Paragraph
Procedure for handling all supplies	2
Special procedure for handling supplies other than munitions	3
Special procedure for handling munitions	4
Regimental supply in different phases of combat	5

2. **Procedure for handling all supplies.**—*a.* The regimental commander decides upon the plan of supply after consultation with the medical officer, the munitions, supply, and plans and training officers. The plan includes—

(1) Procurement of supplies and munitions, of training areas, and of shelters.

(2) Distribution of all supplies, munitions, and equipment, and the location of the regimental distributing point, the regimental munitions distributing point, and the axis of supply.

(3) Procurement and allotment of transportation for personnel, matériel, animals, and for the evacuation of the wounded.

(4) Collection and salvage from the battle fields of matériel desired for immediate reissue.

(5) Disbursement of funds for the maintenance of the regiment (excluding pay of the troops and of regimental and organization funds).

b. The regimental supply officer is responsible for the proper functioning of the supply system in accordance with the plan adopted. His sphere of operations includes the entire regimental area. In the execution of his duties he will, when necessary, personally visit all units of the regiment, G-4 (senior supply officer) of the division, and the division supply officer concerned, from whom he receives supplies.

c. The relation of the battalion supply officers to their respective battalion commanders is similar to that of the regimental supply officer in his relation to the regimental commander. Each is responsible to his immediate commander for the supply of his battalion and attached units. They assist the regimental supply officer in the supervision, coordination, and control of the supply system of the battalion and units attached to the battalion.

The battalion supply officers ascertain the supply requirements of the battalions and attached units by keeping an account of the state of supply of

each unit at all times by personal contact with the personnel, and by anticipating future needs. They submit requisitions to the regimental supply officer for the supplies required.

d. The company commanders of the regimental headquarters company, howitzer company, and service company perform the same duties in their respective companies as battalion supply officers in the battalions.

e. The requisitions from the various units of the regiment are sent to and consolidated at the office of the regimental supply officer. This office is located at the regimental distributing point. Its personnel, which consists of an officer of the supply corps and certain enlisted personnel, is furnished by the supply section, headquarters platoon, service company. (See par. 12.) The consolidated requisitions are furnished to division headquarters for action by the head of the supply service concerned.

3. **Special procedure for handling supplies other than munitions** (see Charts 1 and 2).—*a.* The regimental distributing point, commanded by the service company commander, is the point at which all supplies except munitions are issued to the battalions, special and attached units. To insure proper functioning of the distributing point, and to avoid undue loss of personnel and supplies, the point is usually located 3 to 5 miles in rear of the front lines, under cover and on a road accessible to the field trains. The reception, storage, and issuance of supplies are in direct charge of an officer from the supply section, headquarters platoon, service company, assisted by certain enlisted personnel. (See par. 12 *b* (2) (*a*).)

b. The supplies requisitioned are drawn usually from a representative of the supply service concerned, at the division distributing point, by an officer of the supply section, headquarters platoon, service company, assisted by certain enlisted personnel. (See par. 12 *a.*) He draws and checks the supplies issued, superintends the loading, and either he or his assistant accompanies the supplies to the regimental distributing point, where the supplies are delivered to the officer in charge of receipt, storage, and supply. The transportation furnished for this haul may be either regimental or divisional.

c. Supplies other than munitions also reach the regimental distributing point through salvage. General salvage is not performed by assault regiments. Salvage of articles which are needed but can not be replaced quickly by requisition is arranged for when necessary by the regimental supply officer. The details collect the matériel and deliver it to the regimental distributing point, where it is made ready for reissue.

d. The location of kitchens and the points where the cooked meal and other supplies are to be delivered to carrying parties for the lettered companies are designated by the battalion commanders and by the company commanders of the regimental headquarers company, howitzer and service company for their respective companies. The regimental supply officer coordinates the movement of supplies and kitchens to the points designated.

e. Supplies other than munitions are issued at the regimental distributing point to the battalion supply officers and to the commanders of the regimental headquarters company, howitzer company, and service company, or their representatives. These officers are assisted by certain enlisted personnel. (See par. 12 *b.*) They check supplies issued and superintend the loading. The supplies for each unit are loaded on its own ration cart or other vehicle. The battalion supply officers and the company commanders of the regimental headquarters company, howitzer company, and the service company, or their representatives, accompany the supplies to the kitchens, where the rations are delivered to those second in command or the company commissary stewards. The trains are usually loaded in daylight, but usually will not move forward until dark.

f. The cooked meal and other supplies are delivered to carrying parties at points as close to the troops as the tactical situation and terrain permit. In rough country machine-guns carts can be used advantageously to supplement or replace carrying parties.

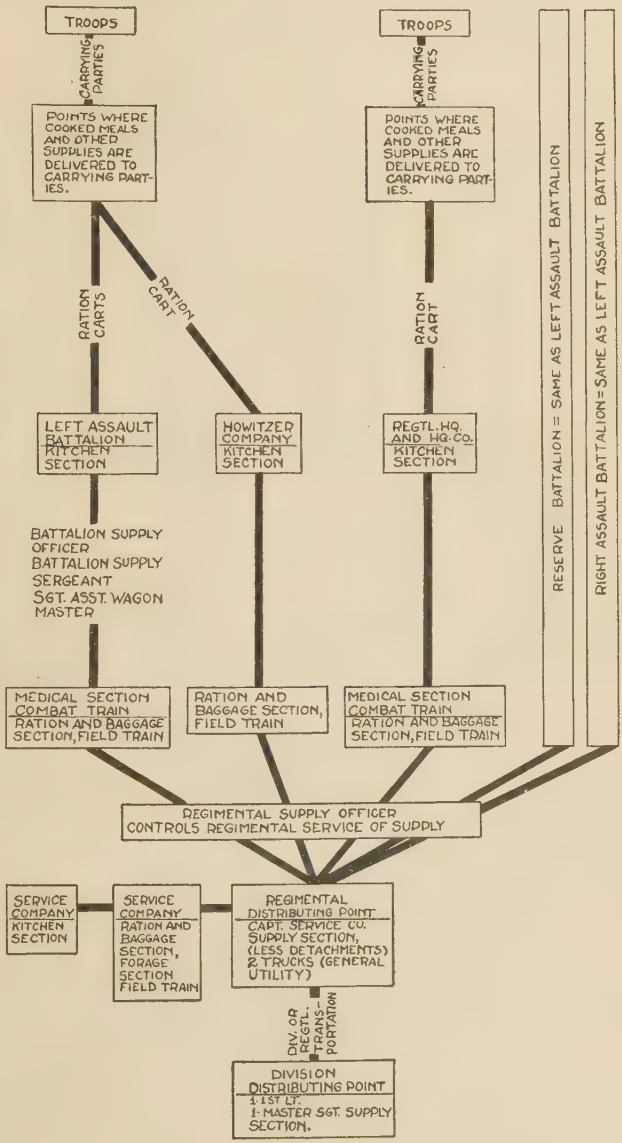
(1) Under conditions which permit the transportation getting forward to the assault battalions the supplies are carried forward by details from the reserve battalion. For such method permission from the regimental commander will be obtained and the method itself coordinated by the regimental supply officer.

(2) When supplies are carried forward by details from the reserve, guides must be furnished by the unit to be supplied.

CHART NO. 1

THE REGIMENTAL SERVICE OF SUPPLY OTHER THAN MUNITIONS IN COMBAT.

NOTE: SINGLE HEAVY LINES ▬ REPRESENT CHANNELS OF SUPPLY. THESE LINES DO NOT REPRESENT ROADS. THIS CHART IS NOT DRAWN TO SCALE.



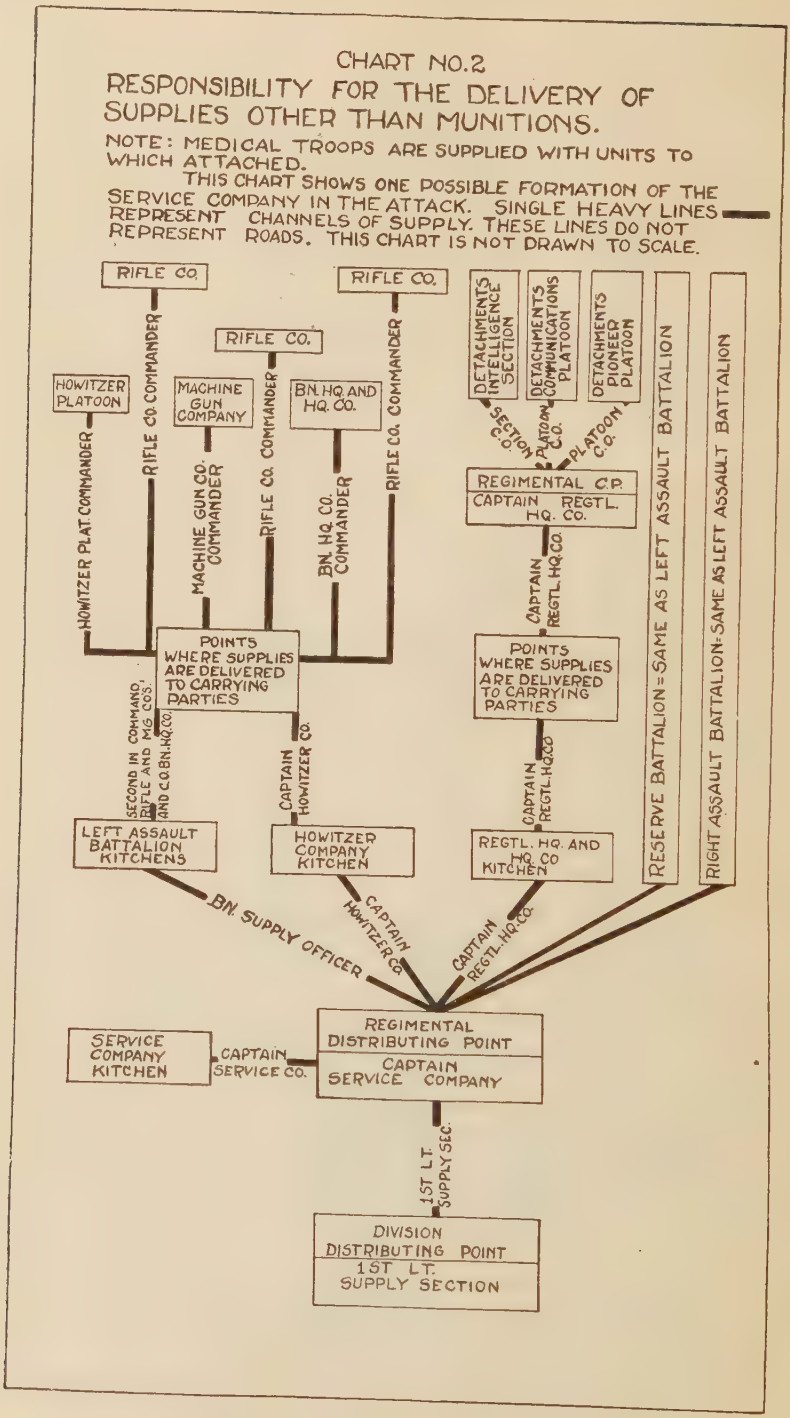


CHART NO. 2
RESPONSIBILITY FOR THE DELIVERY OF SUPPLIES OTHER THAN MUNITIONS.
NOTE: MEDICAL TROOPS ARE SUPPLIED WITH UNITS TO WHICH ATTACHED.
THIS CHART SHOWS ONE POSSIBLE FORMATION OF THE SERVICE COMPANY IN THE ATTACK. SINGLE HEAVY LINES REPRESENT CHANNELS OF SUPPLY. THESE LINES DO NOT REPRESENT ROADS. THIS CHART IS NOT DRAWN TO SCALE.
RIFLE CO.
RIFLE CO.
RIFLE CO.
HOWITZER PLATOON
MACHINE GUN COMPANY
BN. HQ. AND HQ. CO.
DETACHMENTS INTELLIGENCE SECTION
DETACHMENTS COMMUNICATIONS PLATOON
DETACHMENTS PIONEER PLATOON
HOWITZER PLAT. COMMANDER
RIFLE CO. COMMANDER
MACHINE GUN CO. COMMANDER
RIFLE CO. COMMANDER
BN. HQ. CO. COMMANDER
RIFLE CO. COMMANDER
SECTION C.O.
PLATOON C.O.
PLATOON C.O.
REGIMENTAL C.P.
CAPTAIN REGTL. HQ. CO.
CAPTAIN REGTL. HQ. CO.
POINTS WHERE SUPPLIES ARE DELIVERED TO CARRYING PARTIES
POINTS WHERE SUPPLIES ARE DELIVERED TO CARRYING PARTIES
SECOND IN COMMAND, RIFLE AND MG COS. AND CO. BN. HQ. CO.
CAPTAIN HOWITZER CO.
CAPTAIN REGTL. HQ. CO.
RESERVE BATTALION = SAME AS LEFT ASSAULT BATTALION
RIGHT ASSAULT BATTALION = SAME AS LEFT ASSAULT BATTALION
LEFT ASSAULT BATTALION KITCHENS
HOWITZER COMPANY KITCHEN
REGTL. HQ. AND HQ. CO KITCHEN
BN. SUPPLY OFFICER
CAPTAIN HOWITZER CO.
CAPTAIN REGTL. HQ. CO.
SERVICE COMPANY KITCHEN
CAPTAIN SERVICE CO.
REGIMENTAL DISTRIBUTING POINT
CAPTAIN SERVICE COMPANY
1ST LT. SUPPLY SEC.
DIVISION DISTRIBUTING POINT
1ST LT. SUPPLY SECTION

g. Detachments operating within a company area are normally attached to that company for rations and supplies.

h. The field train when not engaged in hauling supplies is parked under cover or camouflaged in the vicinity of the regimental distributing point.

The corral and wagon park are commanded by a lieutenant (j. g.), transportation platoon, service company, assisted by certain enlisted personnel. (See par. 14.)

4. Special procedure for handling munitions (see Charts 3 and 4).—*a.* The system of supplying munitions during combat differs somewhat from that by which other supplies are replenished. The requirements of other supplies are continuous, whereas the requirements of munitions are spasmodic. Neither the exact quantity nor the time of replenishment can be foreseen, though probable needs must be estimated so that sudden shortage will not occur.

b. The regimental munitions officer, under supervision of the regimental commander, carries out the plan of munitions supply, supervising, coordinating, and controlling the supply of munitions within the regimental area.

c. Before deployment for combat the munitions sections of the battalion combat train habitually follow the battalion without distance.

(1) Before taking up the approach march, extra munitions are issued to the rifle companies, after which the empty vehicles report to the regimental munitions officer at a point designated by the regimental commander.

(2) Extra munitions usually are not issued to the machine-gun companies and the howitzer company before the approach march is begun. During the approach march ammunition carts are conducted as far forward as they can travel with safety. The munitions are dumped when needed at company or platoon munitions distributing points if the situation permits. From these points they are carried forward by carrying parties.

(3) After the issuance of extra munitions the combat wagons of the regiment and attached units are consolidated into a regimental munitions train, commanded by the regimental munitions officer.

d. A regimental munitions distributing point when necessary is established by the regimental munitions officer. At this point the munitions are distributed to the battalions and special units of, and the units attached to, the regiment. To insure proper functioning of the distributing point and to avoid undue loss of personnel and munitions, the munitions distributing point is located under cover and near a road accessible to the munitions train. It must be located close enough to the assault troops to insure a constant supply of munitions.

e. The munitions requisitioned are drawn at the division munitions distributing point by the regimental munitions officer or his assistant. He or his assistant checks the munitions issued, superintends the loading, and accompanies the munitions to the regimental munitions distributing point. Regimental combat wagons or trucks are used for this haul.

f. The regimental munitions train, under the direction of the regimental munitions officer, advances by bounds along the route of advance, keeping as close to the assault echelons as the tactical situation and terrain permit.

g. Requests for munitions are forwarded to the regimental munitions officer through the regimental command post. The kind of munitions desired, the amount needed, and the place of delivery are specified. The regimental munitions officer or his assistant delivers the munitions to the place designated. guides usually being furnished from the units to be supplied.

h. The battalion munitions distributing point is the point where the regimental munitions train delivers munitions to battalions and for units attached to the battalions. The munitions are carried forward from this point by carrying parties or ammunition carts.

5. Regimental supply in different phases of combat.—*a.* The operation of the regimental supply system in the different phases of combat is the same as prescribed in paragraphs 2 to 4, inclusive.

b. On the march, supply is simplified by the consolidation of the troops within a comparatively small area.

c. In stabilized situations dumps for munitions, rations, water, fuel, and other supplies may be established. Munition dumps may also be established in a retreat.

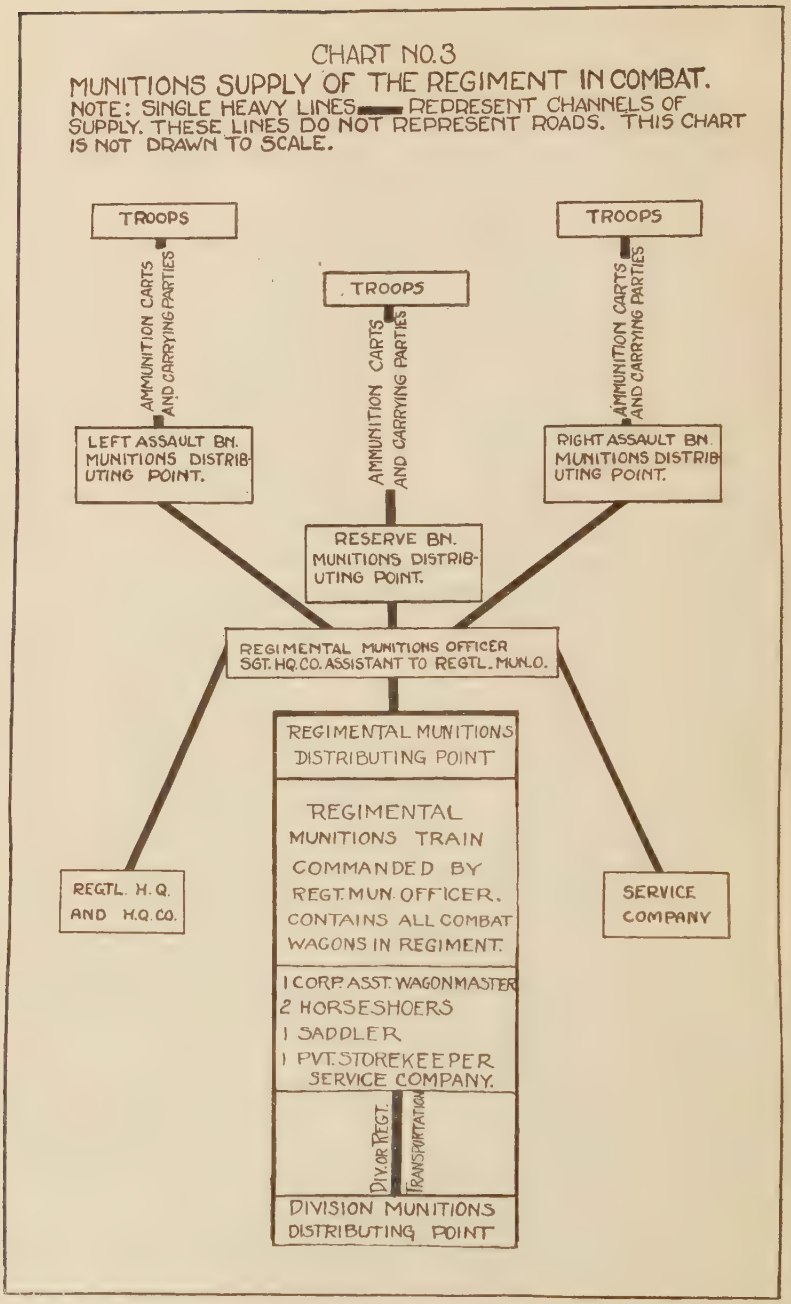


CHART NO. 3
MUNITIONS SUPPLY OF THE REGIMENT IN COMBAT.
NOTE: SINGLE HEAVY LINES REPRESENT CHANNELS OF SUPPLY. THESE LINES DO NOT REPRESENT ROADS. THIS CHART IS NOT DRAWN TO SCALE.
TROOPS
TROOPS
TROOPS
AMMUNITION CARTS AND CARRYING PARTIES
AMMUNITION CARTS AND CARRYING PARTIES
AMMUNITION CARTS AND CARRYING PARTIES
LEFT ASSAULT BN. MUNITIONS DISTRIBUTING POINT.
RIGHT ASSAULT BN. MUNITIONS DISTRIBUTING POINT.
RESERVE BN. MUNITIONS DISTRIBUTING POINT.
REGIMENTAL MUNITIONS OFFICER SGT. HQ. CO. ASSISTANT TO REGTL. MUN. O.
REGIMENTAL MUNITIONS DISTRIBUTING POINT
REGIMENTAL MUNITIONS TRAIN COMMANDED BY REGT. MUN. OFFICER. CONTAINS ALL COMBAT WAGONS IN REGIMENT.
1 CORP. ASST. WAGONMASTER
2 HORSESHOERS
1 SADDLER
1 PVT. STOREKEEPER
SERVICE COMPANY.
DIV. OR REGT.
TRANSPORTATION
DIVISION MUNITIONS DISTRIBUTING POINT
REGTL. H. Q. AND H. Q. CO.
SERVICE COMPANY

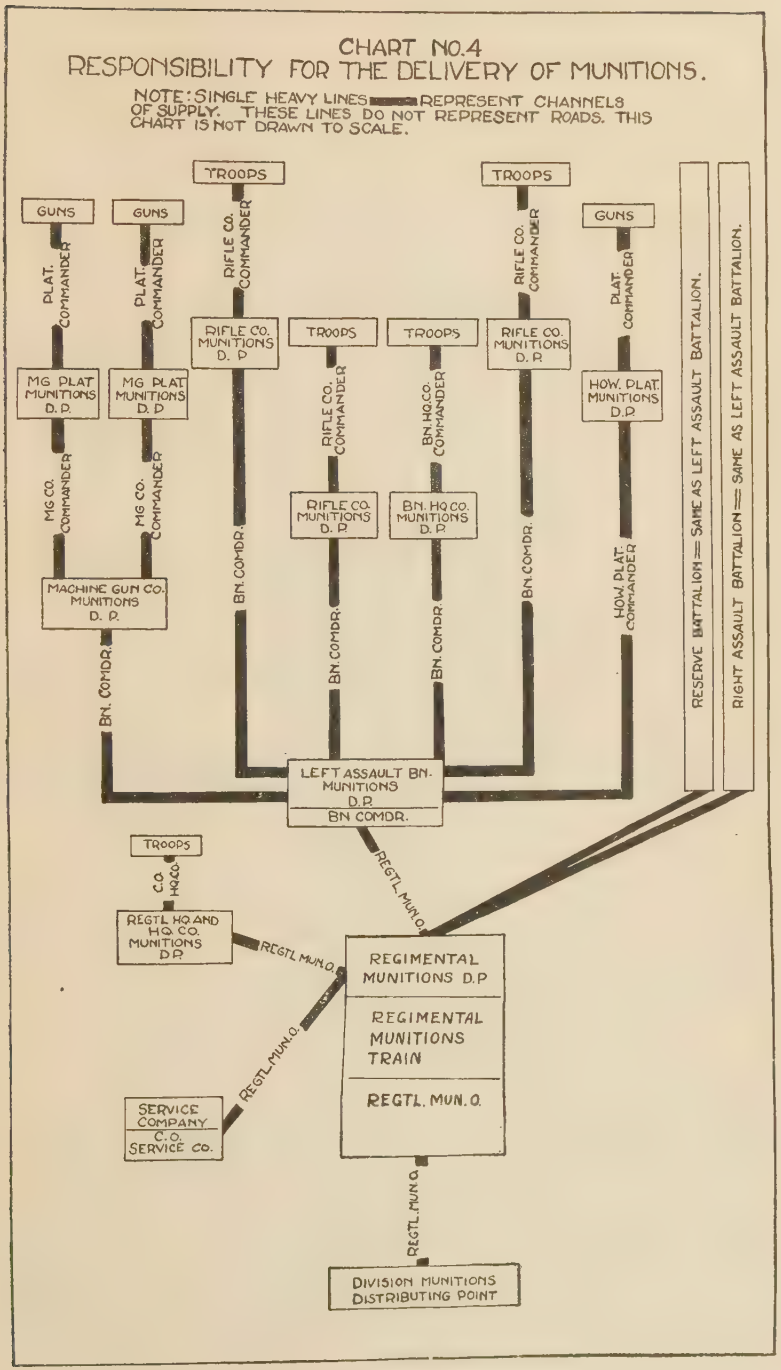


CHART NO.4
RESPONSIBILITY FOR THE DELIVERY OF MUNITIONS.
NOTE: SINGLE HEAVY LINES REPRESENT CHANNELS OF SUPPLY. THESE LINES DO NOT REPRESENT ROADS. THIS CHART IS NOT DRAWN TO SCALE.
TROOPS
TROOPS
GUNS
GUNS
GUNS
PLAT. COMMANDER
PLAT. COMMANDER
RIFLE CO. COMMANDER
RIFLE CO. COMMANDER
PLAT. COMMANDER
RIFLE CO. MUNITIONS D. P
TROOPS
TROOPS
RIFLE CO. MUNITIONS D. P
MG PLAT MUNITIONS D. P.
MG PLAT MUNITIONS D. P
RIFLE CO. COMMANDER
BN. HQ. CO. COMMANDER
HOW. PLAT. MUNITIONS D.P
MG CO. COMMANDER
MG CO. COMMANDER
RIFLE CO. MUNITIONS D. P
BN. HQ. CO. MUNITIONS D. P
MACHINE GUN CO. MUNITIONS D. P.
BN. COMDR.
BN. COMDR.
BN. COMDR.
BN. COMDR.
BN. COMDR.
HOW. PLAT. COMMANDER
RESERVE BATTALION = SAME AS LEFT ASSAULT BATTALION.
RIGHT ASSAULT BATTALION = SAME AS LEFT ASSAULT BATTALION.
LEFT ASSAULT BN. MUNITIONS D.P.
BN COMDR.
REGTL. MUN. O.
TROOPS
C.O. HQ. CO.
REGTL. HQ AND HQ. CO. MUNITIONS D.P.
REGTL. MUN. O.
REGIMENTAL MUNITIONS D.P
REGIMENTAL MUNITIONS TRAIN
REGTL. MUN. O.
REGTL. MUN. O.
SERVICE COMPANY
C.O. SERVICE CO.
REGTL. MUN. O.
DIVISION MUNITIONS DISTRIBUTING POINT

Section III.—THE EXECUTION OF THE ADMINISTRATIVE AND PERSONNEL WORK OF THE REGIMENTAL HEADQUARTERS

(See Chart 5)

	Paragraph
Forward echelon	6
Rear echelon	7

6. Forward echelon.—*a. Composition.*—The forward echelon consists of the regimental adjutant and such enlisted personnel as the regimental commander may direct.

b. Location.—It is located at the regimental command post.

c. Operations.—(1) Administrative and personnel reports are submitted by all units to the regimental adjutant, who forwards them to the assistant adjutant in the rear echelon.

(2) In times of stress, personnel data of the regiment frequently will be required by the regimental commander, or higher authority, within a short space of time. The assistant adjutant, in the rear echelon, usually will not have the latest data from which to make out these emergency reports and be able to submit them in the time required. Therefore the adjutant, assisted by such enlisted personnel as designated by the regimental commander, keeps a record of such administrative and personnel data as will be needed on short notice. These data are obtained from extracts made of administrative and personnel reports submitted to him by the units of the regiment, from information obtained from the regimental staff, by personal reconnaissance, and from other sources. From these records he is able to submit personnel or administrative reports on short notice.

7. Rear echelon.—*a. Composition.*—The administrative and personnel forces in the rear echelon consist of the personnel office force, the mail force, and the company yeomen. It operates under the supervision of the lieutenant (j. g.), staff section, who is the assistant adjutant. (See Sec. V.)

b. Location.—On the march this group habitually accompanies the field train, in which the records are kept. During combat it is located in the vicinity of the regimental distributing point, preferably under shelter, to keep the records in serviceable condition. (See Chart 5.)

c. Operation.—The personnel office force performs the routine regimental personnel and administrative work. The mail force receives, distributes, collects, and forwards the mail. The company yeomen perform the administrative work of the companies and keep the company records up to date. (See Sec. V.)

Section IV.—THE BAND SECTION IN COMBAT

	Paragraph
Operations	8

8. Operations.—Normally the band has no combat functions. However, during combat, when the situation requires, the personnel may be used to assist in evacuating the wounded.

Section V.—DUTIES OF PERSONNEL IN COMBAT

	Paragraph
Introduction	9
Company headquarters	10
Staff section, headquarters platoon	11
Supply section, headquarters platoon	12
Band section, headquarters platoon	13
Transportation platoon	14

9. Introduction.—The organization of the service company is elastic. Duties performed by its individuals vary with the tactical situation and terrain. The combat duties of individuals enumerated will be taken as a guide only, changes being made when necessary.

10. Company headquarters.—*a. The lieutenant, company commander.*—(1) He commands the company and is responsible for its organization, instruction, training, supply, and discipline.

(2) He maintains tactical control of that part of the company which operates in the rear echelon.

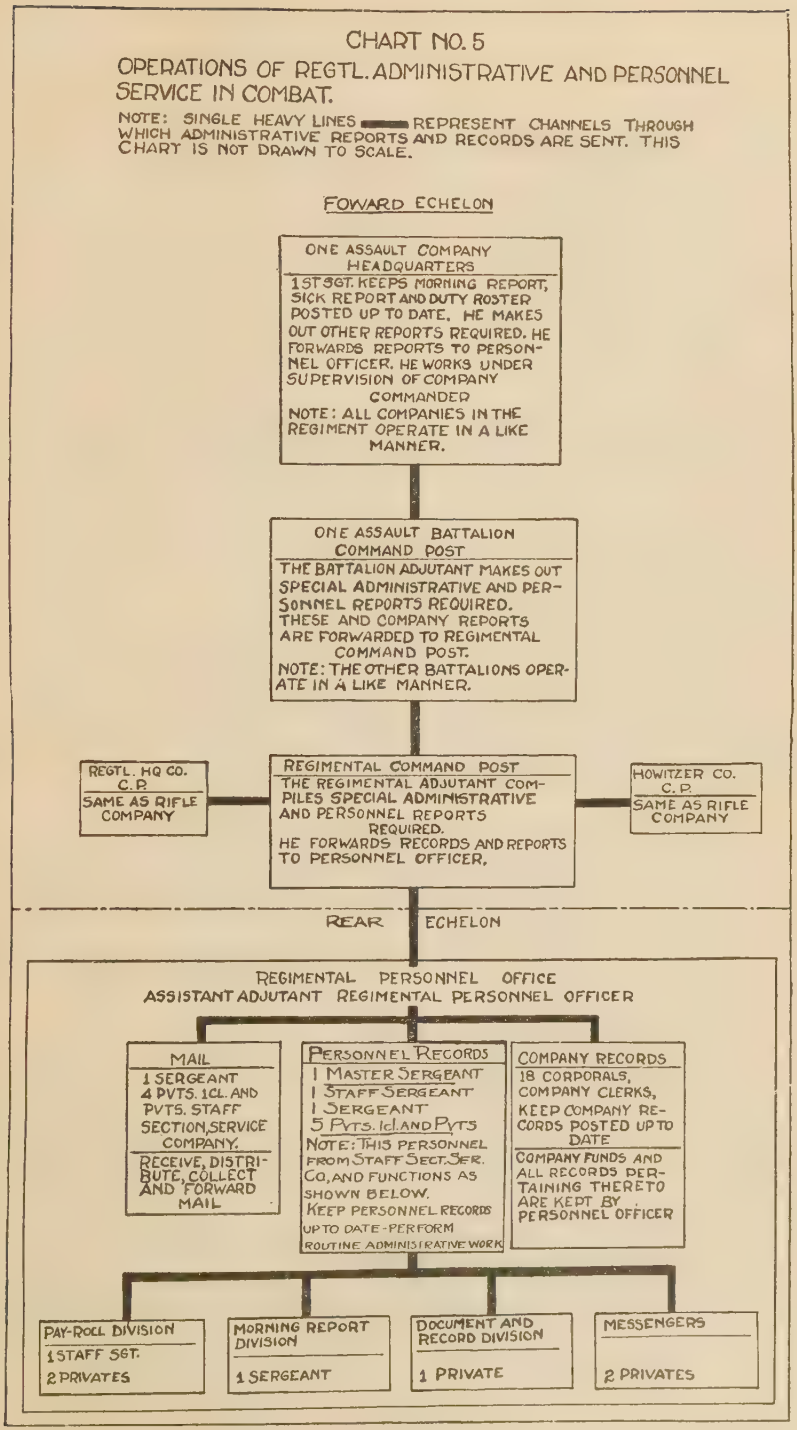


CHART NO. 5
OPERATIONS OF REGTL. ADMINISTRATIVE AND PERSONNEL SERVICE IN COMBAT.
NOTE: SINGLE HEAVY LINES REPRESENT CHANNELS THROUGH WHICH ADMINISTRATIVE REPORTS AND RECORDS ARE SENT. THIS CHART IS NOT DRAWN TO SCALE.
FOWARD ECHELON
ONE ASSAULT COMPANY HEADQUARTERS
1ST SGT. KEEPS MORNING REPORT, SICK REPORT AND DUTY ROSTER POSTED UP TO DATE. HE MAKES OUT OTHER REPORTS REQUIRED. HE FORWARDS REPORTS TO PERSONNEL OFFICER. HE WORKS UNDER SUPERVISION OF COMPANY COMMANDER
NOTE: ALL COMPANIES IN THE REGIMENT OPERATE IN A LIKE MANNER.
ONE ASSAULT BATTALION COMMAND POST
THE BATTALION ADJUTANT MAKES OUT SPECIAL ADMINISTRATIVE AND PERSONNEL REPORTS REQUIRED. THESE AND COMPANY REPORTS ARE FORWARDED TO REGIMENTAL COMMAND POST.
NOTE: THE OTHER BATTALIONS OPERATE IN A LIKE MANNER.
REGTL. HQ CO. C.P.
SAME AS RIFLE COMPANY
REGIMENTAL COMMAND POST
THE REGIMENTAL ADJUTANT COMPILES SPECIAL ADMINISTRATIVE AND PERSONNEL REPORTS REQUIRED.
HE FORWARDS RECORDS AND REPORTS TO PERSONNEL OFFICER.
HOWITZER CO. C.P.
SAME AS RIFLE COMPANY
REAR ECHELON
REGIMENTAL PERSONNEL OFFICE
ASSISTANT ADJUTANT REGIMENTAL PERSONNEL OFFICER
MAIL
1 SERGEANT
4 PVTS. 1CL. AND PVTS. STAFF SECTION, SERVICE COMPANY.
RECEIVE, DISTRIBUTE, COLLECT AND FORWARD MAIL
PERSONNEL RECORDS
1 MASTER SERGEANT
1 STAFF SERGEANT
1 SERGEANT
5 PVTS. 1CL. AND PVTS
NOTE: THIS PERSONNEL FROM STAFF SECT. SER. CO, AND FUNCTIONS AS SHOWN BELOW.
KEEP PERSONNEL RECORDS UP TO DATE - PERFORM ROUTINE ADMINISTRATIVE WORK
COMPANY RECORDS
18 CORPORALS, COMPANY CLERKS, KEEP COMPANY RECORDS POSTED UP TO DATE
COMPANY FUNDS AND ALL RECORDS PERTAINING THERETO ARE KEPT BY PERSONNEL OFFICER
PAY-ROLL DIVISION
1 STAFF SGT.
2 PRIVATES
MORNING REPORT DIVISION
1 SERGEANT
DOCUMENT AND RECORD DIVISION
1 PRIVATE
MESSENGERS
2 PRIVATES

(3) He is responsible for carrying out all orders issued by the regimental commander to elements of the service company which operates in the rear echelon.

(4) He establishes, commands, and directs the movements of the regimental distributing point.

(5) He supervises the receipt, storage, and issuance of supplies and the office work pertaining thereto at the regimental distributing point.

b. Miscellaneous.—The duties of the company chief petty officer, commissary steward, supply petty officer, company yeoman, barber, cobbler, tailor, mess cooks, and cooks are the same as those prescribed for enlisted men of similar grades in the rifle company. (See TR 420-120.)

c. The petty officer assistant to the commissary steward.—(1) He draws supplies for the company at the regimental distributing point, checks them, and reports shortages to the company commander.

(2) He superintends loading of the supplies on the company transportation and accompanies them to the place of delivery, where he turns them over to the commissary steward.

(3) He performs such other duties as may be designated by the company commander.

11. Staff section, headquarters platoon.—*a. The lieutenant (j. g.), assistant adjutant.*—He supervises the operation of the personnel of the staff section and the company storekeepers in the rear echelon and is responsible for all personnel records of the regiment and such others as may be assigned to his office.

b. Personnel office force.—(1) *Chief yeoman.*—He supervises and checks all work of the staff section and personally performs such clerical duties as may be designated by the assistant adjutant.

(2) *Two yeomen.*—They assist in the record work.

(3) *One yeoman.*—He is in charge of the morning reports, all data pertaining thereto, and rosters.

(4) *One yeoman.*—He is the general office yeoman and performs such clerical duties as may be assigned him by the assistant adjutant.

(5) *Two seamen, messengers.*—They perform all usual messenger duties.

c. Mail force.—(1) *One senior mail orderly.*—He has charge of the receipt, distribution, collection, and forwarding of the mail.

(2) *Four mail orderlies.*—One is assigned to each battalion and one to the attached and special units. They assist the senior mail orderly in his duties.

d. Miscellaneous.

(1) *One chief petty officer, master-at-arms.*

(*a*) He performs the duties of master-at-arms under the supervision of the regimental plans and training officer.

(*b*) He commands the regimental stragglers' post, a detachment usually from the reserve being placed under his command for this duty.

(*c*) He collects stragglers within the regimental area, returning them to their organizations after having taken their names.

(2) *One petty officer, color guard.*

(*a*) He remains with the colors, which are loaded with the regimental baggage on the field train.

(*b*) He commands the guard, which remains with the regimental baggage.

(3) *One yeoman, chaplains' assistant.*—He is a yeoman for the chaplains and performs the duties required by them.

12. Supply section, headquarters platoon.—*a. At division distributing point*—

(1) *The officer of the supply corps.*

(*a*) He draws all supplies, except munitions, from the representative of the supply service concerned.

(*b*) He checks the supplies issued, and superintends the loading.

(*c*) He delivers at the regimental distributing point supplies, except munitions, to the officer in charge of receipt, storage, and issue.

(*d*) Either he or his assistant accompanies the supplies to the point of delivery.

(2) *One chief storekeeper.*—He performs duties required by the officer of the supply corps.

b. At the regimental distributing point—

(1) *The office force, regimental supply officer.*

(*a*) *The officer of the supply corps.*—He keeps himself informed of the situation, so as to be able at any time to take over the administration of the duties of the company. He is in charge of the office force of the regimental supply officer; he supervises and directs their work, checks requisitions, procurements, issues, and salvage. He assists in the receipt, storage, and issue of supplies at the regimental distributing point as directed by the commanding officer, service company.

(*b*) *One pay clerk.*—He supervises the work of the office force, checks requisitions, procurements, issues, and salvage, and performs such other work as prescribed by the officer of the supply corps, such as keeping the regimental pay rolls, etc.

(*c*) *The yeoman or storekeeper.*—He is the stenographer and file clerk for the regimental supply officer. He has charge of and keeps posted up to date all files in the office of the regimental supply officer.

(*d*) *Three storekeepers.*—They prepare all paper work connected with rations, fuel and forage, and all other supplies.

(2) *Group in charge of receipt, storage, and issue.*

(*a*) *The assistant supply officer.*—He receives supplies, other than munitions, from the division distributing point and salvage. He stores and distributes them to the organizations of the regiment and attached units.

(*b*) *One chief storekeeper.*—He assists the officer of the supply corps in charge in the receipt, storage, and issue of supplies and salvage.

(*c*) *Two storekeepers.*—They keep a record of the supplies and salvage received, on hand, and issued. They store and guard supplies on hand. The salvage is sorted and prepared for reissue by a detail of mechanics from the organizations of the regiment.

(3) *Miscellaneous.*

(*a*) *One ship fitter.*—He repairs all regimental transportation from spare parts and accessories on hand. On the march he sees that necessary emergency repairs are made from spare parts carried on the wagon. He will also observe the train while on the march to ascertain what repairs will be needed on the next halt. He assists in the receipt, storage, and distribution of supplies at the regimental distributing point.

(*b*) *Three seamen (cobblers).*—They operate the shoe-repair machine. They repair shoes for the entire regiment. They assist in the storage, receipt, and distribution of supplies at the regimental distributing point.

c. With battalions, three commissary stewards or storekeepers.—One commissary steward assists the battalion supply officer of each battalion in ascertaining the needs of the battalion and attached units; in receiving supplies, other than munitions, at the regimental distributing point; and in the loading, transporting, and unloading of supplies, and in issuing them to the organizations of the battalion and attached units.

d. At the regimental munitions distributing point, one gunner's mate.—He assists the regimental munitions officer in the receipt, storage, and issue of munitions at the regimental munitions distributing point.

13. Band section, headquarters platoon.—The duties of the band section are the same as those prescribed in time of peace, except as noted in Section IV.

14. Transportation platoon.—*a. The lieutenant (j. g.).*—(1) He is the regimental inspector of transportation and animals.

(2) He is responsible for the maintenance and replacement of all regimental transportation and for the care and feeding of animals.

(3) He commands the corral and park of the field train, located near the regimental distributing point.

b. One chief petty officer, wagonmaster.—(1) He checks, at least once daily, the animals, vehicles, harness, and other equipment in the field and combat trains, reporting shortages to the transportation officer.

(2) He supervises the watering, feeding, and grooming of animals.

(3) He is responsible that each animal is groomed at least once daily, and particularly that those parts of the animal's skin that come in contact with harness are well washed.

(4) He frequently examines the bodies of animals to see that they are in sound condition. Careful attention and treatment are given to bunches or injuries, and readjustments of harness are made to prevent reoccurrence of such injuries.

(5) He is constantly on the watch for animals showing signs of weakness and to see that they are replaced with spare animals.

(6) He inspects all animals at the end of each day's march. Under combat conditions the replacement of animals is a serious question, so every effort must be made to give proper attention and care to those on hand. Frequently, with insufficient forage, constant work day and night, and the scarcity of wholesome water, the animal's vitality is greatly lowered. To overcome this condition, additional grooming and careful and gentle handling must be insisted upon by all who are connected with the management and use of animals.

(7) He supervises the adjustment of harness and sees that animals are properly harnessed, hitched, and driven.

(8) He supervises the loading and unloading of wagons to see that cargo is properly placed, distributed, and secured, and that the wagons are not overloaded.

(9) At night he sees that all harness is kept off the ground and placed under cover. He sees that the harness is kept clean and that when wet it is spread out and dried.

c. Five petty officers, assistant wagonmasters.—(1) They are the assistants to the wagonmaster in their respective sections.

(2) They perform duties of a similar nature to those prescribed for the wagonmaster, and such other duties as the wagonmaster directs.

(3) They cause the loads and the vehicles to be placed as indicated by the wagonmaster.

(4) They keep a memorandum of all cargo received, and to whom issued, together with the dates.

(5) They mark and tag packages in order that no cargo will be in danger of being diverted.

(6) They may be called upon to direct the march of the section.

d. One seaman.—(1) He is assistant to the wagonmaster for the regimental headquarters and headquarters section.

(2) He performs duties similar to those prescribed for the assistant wagonmasters.

e. One seaman.—(1) He is assistant to the wagonmaster for the regimental munitions train.

(2) He performs duties similar to those prescribed for the assistant wagonmasters.

f. The stable petty officer.—(1) Under the direction of the wagonmaster he has general supervision of the watering, feeding, grooming, and shoeing of animals.

(2) He receives and issues forage at the regimental distributing point.

(3) He selects picket lines.

(4) He supervises the work of the saddlers.

g. The horseshoers.—(1) They are charged with the fitting and shoeing of all animals of the regiment except those of the machine-gun companies and howitzer company.

(2) On the march they are prepared to replace cast shoes and watch for loose shoes to be tightened during the next halt.

(3) When a battalion or other section is detached from the train, the horseshoer assigned to that train accompanies it.

h. The saddlers.—They are charged with the repair of saddles, harness, and leather equipment of the regiment, except that of the machine-gun company.

i. Seamen, wagoners, and assistant wagoners.—For duties as assigned.

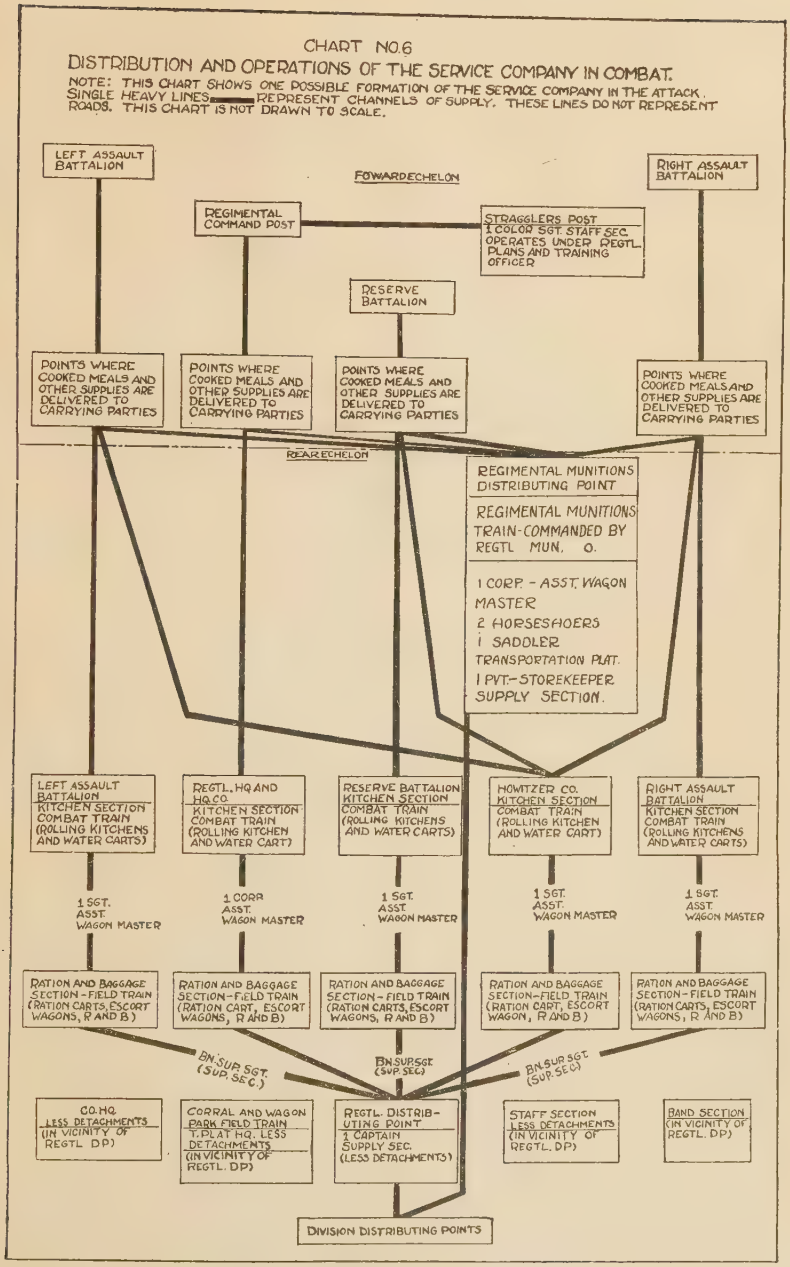


CHART NO.6
DISTRIBUTION AND OPERATIONS OF THE SERVICE COMPANY IN COMBAT.
NOTE: THIS CHART SHOWS ONE POSSIBLE FORMATION OF THE SERVICE COMPANY IN THE ATTACK. SINGLE HEAVY LINES ▬▬ REPRESENT CHANNELS OF SUPPLY. THESE LINES DO NOT REPRESENT ROADS. THIS CHART IS NOT DRAWN TO SCALE.
LEFT ASSAULT BATTALION
FOWARD ECHELON
RIGHT ASSAULT BATTALION
REGIMENTAL COMMAND POST
STRAGGLERS POST
1 COLOR SGT. STAFF SEC.
OPERATES UNDER REGTL. PLANS AND TRAINING OFFICER
RESERVE BATTALION
POINTS WHERE COOKED MEALS AND OTHER SUPPLIES ARE DELIVERED TO CARRYING PARTIES
POINTS WHERE COOKED MEALS AND OTHER SUPPLIES ARE DELIVERED TO CARRYING PARTIES
POINTS WHERE COOKED MEALS AND OTHER SUPPLIES ARE DELIVERED TO CARRYING PARTIES
POINTS WHERE COOKED MEALS AND OTHER SUPPLIES ARE DELIVERED TO CARRYING PARTIES
REAR ECHELON
REGIMENTAL MUNITIONS DISTRIBUTING POINT
REGIMENTAL MUNITIONS TRAIN-COMMANDED BY REGTL MUN. O.
1 CORP. - ASST. WAGON MASTER
2 HORSESHOERS
1 SADDLER
TRANSPORTATION PLAT.
1 PVT.-STOREKEEPER
SUPPLY SECTION.
LEFT ASSAULT BATTALION KITCHEN SECTION COMBAT TRAIN (ROLLING KITCHENS AND WATER CARTS)
REGTL. HQ AND HQ. CO. KITCHEN SECTION COMBAT TRAIN (ROLLING KITCHEN AND WATER CART)
RESERVE BATTALION KITCHEN SECTION COMBAT TRAIN (ROLLING KITCHENS AND WATER CARTS)
HOWITZER CO. KITCHEN SECTION COMBAT TRAIN (ROLLING KITCHEN AND WATER CART)
RIGHT ASSAULT BATTALION KITCHEN SECTION COMBAT TRAIN (ROLLING KITCHENS AND WATER CARTS)
1 SGT. ASST. WAGON MASTER
1 CORP ASST. WAGON MASTER
1 SGT. ASST. WAGON MASTER
1 SGT. ASST. WAGON MASTER
1 SGT. ASST. WAGON MASTER
RATION AND BAGGAGE SECTION-FIELD TRAIN (RATION CARTS, ESCORT WAGONS, R AND B)
RATION AND BAGGAGE SECTION-FIELD TRAIN (RATION CART, ESCORT WAGONS, R AND B)
RATION AND BAGGAGE SECTION-FIELD TRAIN (RATION CARTS, ESCORT WAGONS, R AND B)
RATION AND BAGGAGE SECTION-FIELD TRAIN (RATION CART, ESCORT WAGON, R AND B)
RATION AND BAGGAGE SECTION-FIELD TRAIN (RATION CARTS, ESCORT WAGONS, R AND B)
BN. SUP. SGT. (SUP. SEC.)
BN. SUP. SGT. (SUP. SEC.)
BN. SUP. SGT. (SUP. SEC.)
CO. HQ. LESS DETACHMENTS (IN VICINITY OF REGTL. DP)
CORRAL AND WAGON PARK FIELD TRAIN T. PLAT HQ. LESS DETACHMENTS (IN VICINITY OF REGTL. DP)
REGTL. DISTRIBUTING POINT 1 CAPTAIN SUPPLY SEC. (LESS DETACHMENTS)
STAFF SECTION LESS DETACHMENTS (IN VICINITY OF REGTL. DP)
BAND SECTION (IN VICINITY OF REGTL. DP)
DIVISION DISTRIBUTING POINTS

TRAINING REGULATIONS, NO. 420-185

INFANTRY

Combat Principles—The Infantry Brigade

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Section I.—INTRODUCTION

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1. General considerations.—*a.* The combat principles of the infantry brigade, when considered solely as a grouping of infantry units, and depending solely upon infantry weapons for its combat strength, are analogous to those of the regiment.

b. The combat principles of the infantry brigade as discussed herein contemplate supplementing the fire power of the component infantry regiments primarily by supporting or attached artillery.

2. Composition.—*a.* The infantry brigade is a purely tactical unit. It consists solely of infantry regiments, but the combat efforts of its component regiments are normally supplemented by supporting or attached artillery or by other arms or services.

b. To increase its fighting effectiveness when acting independently, or for the accomplishment of a particular mission when fighting as part of a larger force, the brigade may have temporarily attached to it artillery and varying quotas of other arms and services.

c. Supporting artillery remains under the control of the next higher unit of which the brigade is a part, and the maintenance of this unity of artillery command facilitates the action of the brigade by timely maximum concentrations on the most serious obstacles of the enemy.

3. The staff.—*a.* To assist him in the execution of his decisions and other tasks, the brigade commander is provided with a tactical staff.

b. When action is contemplated and while the brigade commander is formulating his plans the staff and subordinate commanders should relieve him of the necessity for personal supervision of routine details.

c. The advance of the brigade in route column, through development and approach march, to deployment is a concern of the brigade commander. The deployment of regiments, advance to and departure from the designated line of departure, is a concern of the regimental commanders, subject to staff coordination. The advance of the regiments from line of departure to first firing position is a concern of the regimental commanders. The subsequent advance by fire and movement against the enemy is a concern of commanders of tactical units of the assault echelon, subject to coordination by regimental commanders. Keeping the brigade commander informed as to progress and the situation at the front is a responsibility of staff, commanders concerned, and liaison officers.

d. When artillery is attached to the brigade, the artillery commander acts as the chief of artillery on the staff of the brigade commander. Whether or not the artillery is supporting or attached, the command post of the artillery should be established in as close proximity to the command post of the brigade commander as the tactical and technical considerations of control, command, and communications permit. In any case the artillery commander is the technical adviser on artillery matters, and it is primarily through him that artillery fire is shifted, concentrated, or lifted to meet the combat requirements of the brigade.

e. If the exigencies of the situation prevent this intimate relationship of infantry and artillery command posts, an artillery officer is sent to brigade

headquarters to represent the artillery commander, and he becomes the connecting link in liaison between the two headquarters for the accomplishment of the duties set forth in subparagraph *d*. However, he exercises no command functions except by special arrangement with the commander of the artillery unit concerned.

f. In a tactical enterprise involving larger units it is essential that brigade commanders have constant knowledge of the movements, location, and plans of the brigades on their immediate right and left. This is accomplished by sending to the neighboring brigades a liaison officer and a group of enlisted men sufficient to maintain communication between the two headquarters. It is desirable that the officer commanding the liaison group submit periodic reports to his brigade commander. The staff of the brigade to which the liaison group is sent should give the liaison officer access to all information that might be of benefit to his brigade commander.

4. Orders.—*a*. When acting as part of a larger unit, the orders given to the brigade commander will clearly describe the plan and picture the enemy situation as vividly as intelligence agencies permit. In addition, they should assign the brigade a route of advance, a zone of action, or a sector and a mission.

b. When acting alone, the orders given the brigade commander will contain primarily the mission and such information regarding the plan and enemy situation as to enable him, after considering later information gained through personal reconnaissance and through his own intelligence agencies, to formulate a definite plan for the accomplishment of his mission.

c. Orders issued by the brigade commander should be clear and comprehensive, so that each subordinate commander will thoroughly understand the general plan, the part he is to play, and the manner in which he is to cooperate with other troops.

d. Brigade orders for the defense of a sector must be specially clear and given in such detail as will insure complete coordination between regiments in their defensive measures.

Section II.—THE BRIGADE IN ATTACK

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5. The advance in route column and development.—*a*. Upon receipt of orders the brigade commander is immediately concerned with the location of definite combat objectives within his zone of action against which he will allot his troops, and with the selection of protected forward areas in which his regiments can deploy and prepare for combat.

b. The brigade commander makes the necessary provisions for reconnaissance of terrain, route of advance, and the enemy. He puts his brigade in march to deployment positions in one or more columns, depending upon local conditions—restrictions as to roads available, enemy air activity, and his long-range artillery fire. He precedes his command as far as possible in order to make a personal reconnaissance as extended as time and conditions permit, preparatory to formulating his plan of attack.

c. It is important that the brigade commander reach an early decision as to the direction of attack, the form of attack, the zones of action of and the boundaries between his regiments, the size of the reserve, the line of departure, and the hour of attack. He should transmit this information promptly to subordinate commanders to permit their timely reconnaissance within their zones of action to determine the most important combat objectives therein with reference to opposing forces, terrain features, hostile defenses, etc.

6. The approach march and deployment.—*a*. Preliminary reconnaissances having been completed, complete or fragmentary orders for the attack are issued, involving the advance from a designated line of departure at a specified hour. The brigade in column or with regiments abreast is placed en route to deployment positions. Battalion and regimental commanders direct such

approach-march formations as the situation requires from time to time. The deployment of the brigade is then effected by the regimental commanders, each making dispositions to overcome enemy obstacles in his zone of action, keeping in mind particular combat objectives with reference to which he evolves his plan of attack.

b. To be prepared to apply the principles of cooperation and mutual support, the brigade commander at this time provides for additional close tactical liaison with adjacent brigades by the detail of connecting groups from his reserve.

c. The deployment of attached arms and services is made in accordance with the missions assigned them in the brigade orders. Machine and 37-mm. guns of reserve battalions are deployed to give increased covering fire to front-line battalions when necessary.

7. **Methods of deployment.**—*a.* The brigade may be deployed with its regiments abreast or in column.

b. When the brigades of a division are deployed abreast, with regiments abreast, one battalion of one regiment will usually constitute the brigade reserve, and one battalion of the other regiment will usually be in division reserve.

c. When the division is deployed in column of brigades, the brigade reserve is furnished by one or both of the front-line regiments, or it may be omitted entirely, depending upon the local situation and the facility with which the brigade commander can control the action by the influence he exerts over supporting artillery. The rear brigade constitutes the division reserve.

d. When artillery or other arms and services are attached to the brigade, the brigade commander can usually better support the combat echelons by retaining all such attached units under his control. However, when warranted by the rapidity of the advance or other local requirements, the brigade commander may attach artillery and auxiliary arms and services to one or both of the attacking infantry regiments.

8. **Position of the brigade commander.**—*a.* During the advance in route column, the approach march, and the deployment, the brigade commander is engaged in personal reconnaissance of the enemy and study of the situation. He is therefore well forward.

b. The brigade commander assembles his regimental and attached unit commanders for instruction covering his plan of action and for the issuance of his orders in fragmentary or final form. This conference is held either at the forward observation post or the command post and in such time as to enable subordinate commanders to make their personal reconnaissance. (See par. 5 *c.*)

c. While the regimental and attached unit commanders are conducting their personal reconnaissance, the brigade commander may station himself at points from which he can personally observe and supervise the advance and later the deployment of his units.

d. During the progress of the action, the brigade commander's station is normally at his command post, which should be located well forward and in the vicinity of his regimental command posts.

e. The brigade commander keeps in touch with the situation in his front and on his flanks by means of reports from his assaulting regiments, connecting groups, special patrols, liaison officers, and observation posts. He leaves his command post for a definite purpose only, such as for additional personal reconnaissance or for consultation with a superior or subordinate commander or the commander of an adjacent brigade.

9. **Communications.**—*a.* To enable regimental commanders to describe promptly and accurately the targets upon which artillery fire would better facilitate the advance of their assaulting troops, it is absolutely essential that uninterrupted signal communication be maintained with attacking regiments and with supporting or attached artillery.

b. Contemplated forward movement of the brigade command post should be communicated early to the commander of supporting or attached artillery to enable the matter to complete the establishment of new lines of signal communication, so that in making the change in command posts liaison will remain uninterrupted.

c. Communication throughout the brigade is a matter that should receive the careful personal attention of the brigade commander in training as well as in action.

10. **Advancing the attack.**—*a.* The important rôle of attached artillery in the preparation for the attack and the attack proper, whether it be in a mobile

situation or from a condition of stabilization, is thoroughly covered in TR 430–105. (Not included in this manual for want of space.)

b. It is the duty of the brigade commander to discuss the use of the supporting artillery and to make known his wishes relative to the support allotted his attacking regiments. The brigade commander gives special consideration to the plans for displacement forward of the supporting artillery and by arrangement with the commander thereof insures adequate support for attacking troops while the displacement is in progress.

c. Except when following a rolling barrage of effective density, the assault echelons of the regiments do not progress uniformly nor in general alignment. One regiment readily overcoming enemy resistance moves forward steadily; the other encountering greater resistance progresses more slowly or is held up. The principle of cooperation and mutual support should be applied if practicable by the forward regiment to assist the advance of the slower. While considering the use of his reserve in this situation the brigade commander has the following options:

(1) To support the attack of troops held up by machine guns and special weapons pertaining to the brigade reserve.

(2) To give the artillery more definite enemy targets in front of the troops held up and to arrange for a heavy concentration to begin at a specified time and to continue for a definite short period of time, sufficient only for the troops held up to close on the enemy during this concentration and assault his position when it lifts. The necessity for giving the commander of troops held up ample advance notice of this arrangement is of prime importance.

(3) To authorize the regimental commander whose assaulting troops have been stopped to maneuver local reserves within the zone of action of the forward regiment for the purpose of attacking the enemy in flank, care being exercised that the commander of the forward regiment is advised of this arrangement.

(4) To direct the commander of the forward regiment to use his local reserves to attack the flank or rear of the enemy holding up the rearmost regiment.

d. The brigade commander advances his reserve from position to position as required by the tactical situation and engages it, when local efforts fail to check a counterattack, to envelop enemy resistance or to take the enemy in the flank by operating through a gap between regiments or between his own and adjacent brigades.

e. The brigade commander keeps the division commander continually advised of the progress of the attack, the situation of his own and neighboring troops and of the enemy in his front. When the situation necessitates the employment of the brigade reserve the division commander is promptly informed.

11. Assaults.—*a.* Local assaults are initiated, along various parts of the front, by the commander of the small front-line units at the proper time and place as demanded by the situation immediately confronting them.

b. When hostile troops have been in close contact for some time a general assault may be prepared and launched, as a surprise, along the brigade front. Such assaults are generally made under the protection of a machine gun and artillery barrage. Careful coordination and preparation in detail are necessary to insure cooperation and success.

12. Continuing the attack, passage of lines, and reorganization.—*a.* During the assault and occupation of the enemy's first position the smaller front-line units may become disorganized. Losses have occurred among the leaders and men and ammunition may be exhausted. Battalion and regimental commanders continue the attack by ordering their reserves to pass through disorganized leading front-line units when necessary. The relieved units are reorganized and follow as reserve.

b. During an advance, a front-line battalion which has been passed through and reorganized may frequently replace a battalion in brigade reserve; the battalion in brigade reserve being released to its respective regimental commander.

c. Throughout the combat the brigade commander directs and coordinates the action of the component regiments, and supports their action by the use of reserves and attached artillery and other arms and services in such manner as to produce the greatest offensive effort of the brigade as a whole.

d. Upon driving the enemy from his final defensive position, the brigade commander either institutes the pursuit or organizes the ground as may be directed in orders or contemplated in the plan of the division commander.

13. The pursuit.—*a.* The pursuit is characterized by a rapid and vigorous advance along the whole front. The enemy is attacked wherever found. Local reserves pass through exhausted or disorganized front-line units and continue the attack. All front-line battalions endeavor to maintain contact with the retreating enemy.

b. Coordination is necessary in pursuit. Battalion and regimental commanders must be definitely informed regarding the zones of action within which their respective units are to advance or the routes they are to follow. They advance without regard to the progress of the units on their right and left. Adjacent battalions and regiments maintain liaison with one another and reconnaissance and security are continuous.

c. The formation of the leading battalions depends upon the proximity of the enemy, the character of the hostile resistance, and the nature of the terrain, and may vary from the deployed attack formation to the advance in route column.

d. Leading units disarm prisoners and direct them to the rear without delaying the advance. Supports and reserves take charge of prisoners and dispose of them as directed in orders. Mopping up is generally performed by battalion and regimental reserves designated for that purpose.

e. The artillery pursues with fire to the limits of its effective range. When the advance is rapid it may be advisable to attach artillery to the leading infantry regiments and battalions in order to permit close and effective artillery support.

14. Organization of the ground.—Whenever the advance of the brigade is suspended for any cause (darkness, relief, enemy), the troops dig in and hold their ground. The brigade commander is responsible that the defensive measures contemplated by the regimental commanders and adjoining brigades are coordinated. (See Sec. III.)

15. Reserve brigade.—*a.* When the division is deployed in column of brigades, troops of the reserve brigade are held available for use in covered positions in rear. The brigade commander establishes his command post near division headquarters.

b. The commander of the reserve brigade maintains constant touch with the situation by means of a liaison officer at the headquarters of the front-line brigade, by personal reconnaissance, by observation posts, and by special patrols. He must be prepared at any time to order units from his own brigade to reinforce the front-line brigade, or to effect a relief or a passage of lines, when the attacking brigade has become exhausted. He may be required to make a flank attack or to hold a defensive position on a flank, or his brigade may become the covering force for troops withdrawing.

Section III.—THE BRIGADE IN DEFENSE

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Use of reserves	18

16. General considerations.—*a.* The principles governing the brigade in attack place emphasis upon movement forward and maneuvering ability, under such accompanying fire as will make these possible. The brigade in defense concedes to the attacking enemy greater opportunities for movement and for maneuver; at the same time it should endeavor to so counteract his fire power, to so impede his forward movement, and to make so difficult his maneuvering ability as to make him exhausted, shaken, and incapable of penetration, should his attack carry him to the main line of resistance of the brigade.

b. The most efficacious protection against enemy fire is greater and more accurate fire placed upon him. If this greater volume of more accurate fire is not available, terrain features and the ground must provide cover and concealment to partially counteract enemy fire superiority. Having arranged for this partial protection, the maximum fire power of all weapons pertaining to or supporting the brigade is directed upon the enemy to further counteract his superiority and ultimately to gain fire superiority over him. These measures may be further supplemented by blinding or otherwise reducing the enemy's visibility by artificial means.

c. Except as qualified by subparagraphs *a* and *b*, the principles enunciated in Sections I and II are applicable to the defense, with the further obvious

modification that the deployment for defense is always made in depth and in accordance with the principles of the organization of the ground.

d. The distance between the main elements of the defense should in general be such that, after taking one line of defense, the enemy must begin again with new preparation for his attack and assault upon the next. Care in this connection should be exercised that enemy artillery fire can not be adjusted and directed upon two lines of defense from the same terrestrial observation point.

17. **Organization for defense.**—*a.* When the attack of the brigade is definitely stopped by hostile resistance, or when for other tactical reasons the brigade assumes the defensive, the brigade commander includes in his reconnaissance and study of the situation special consideration of the terrain to determine a position for his troops that affords them the greatest prospects of ultimately and definitely holding the enemy.

b. Having reached a decision or having been given the decision as to the most promising deployment for the defense of the position in his area, the brigade commander subdivides the area, assigns definite sectors to his regiments, and makes sure that the fire power and defensive arrangements of the component battalions are carefully coordinated within the brigade area and with adjoining brigades in accordance with the general plan for the whole force. It must be borne in mind that at this time a reallotment of reserves may be necessary.

c. He provides for the security, holding, and reserve echelons, causes a redisposition of troops to the front if necessary, and arranges for supporting fire of artillery, machine guns, and other weapons to impede the advance of the enemy and at the same time to make his maneuver operations necessarily difficult.

d. Keeping in mind the probability of a determined enemy overcoming the resistance in the forward areas, the brigade commander arranges for concentrations of greater intensity to fall upon the enemy between the line of resistance of the outpost area and the main line of resistance of the brigade.

e. Should the enemy persistence take him through the security echelon, mechanical obstacles must have been provided to check him where his strength can best be further diminished by the fire of all infantry weapons, so arranged and so directed as to provide mutual support and maximum effect.

18. **Use of reserves.**—*a.* Throughout the brigade sector, the commanders of tactical units are prepared to wield an influence over local actions at critical stages by holding out reserves for counterattack. In rear of the main line of resistance of the brigade there is a general line partially or completely organized upon which are located the regimental reserves. Within their regimental sectors these reserves provide added insurance for the protection of the main line of resistance, preventing enemy penetrations by supporting fire or by counterattacks.

b. The brigade reserve is located to meet tactical requirements and is held in readiness for any action the situation might require within the brigade sector.

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